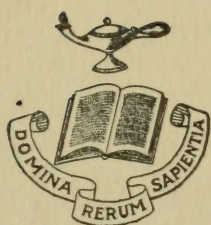
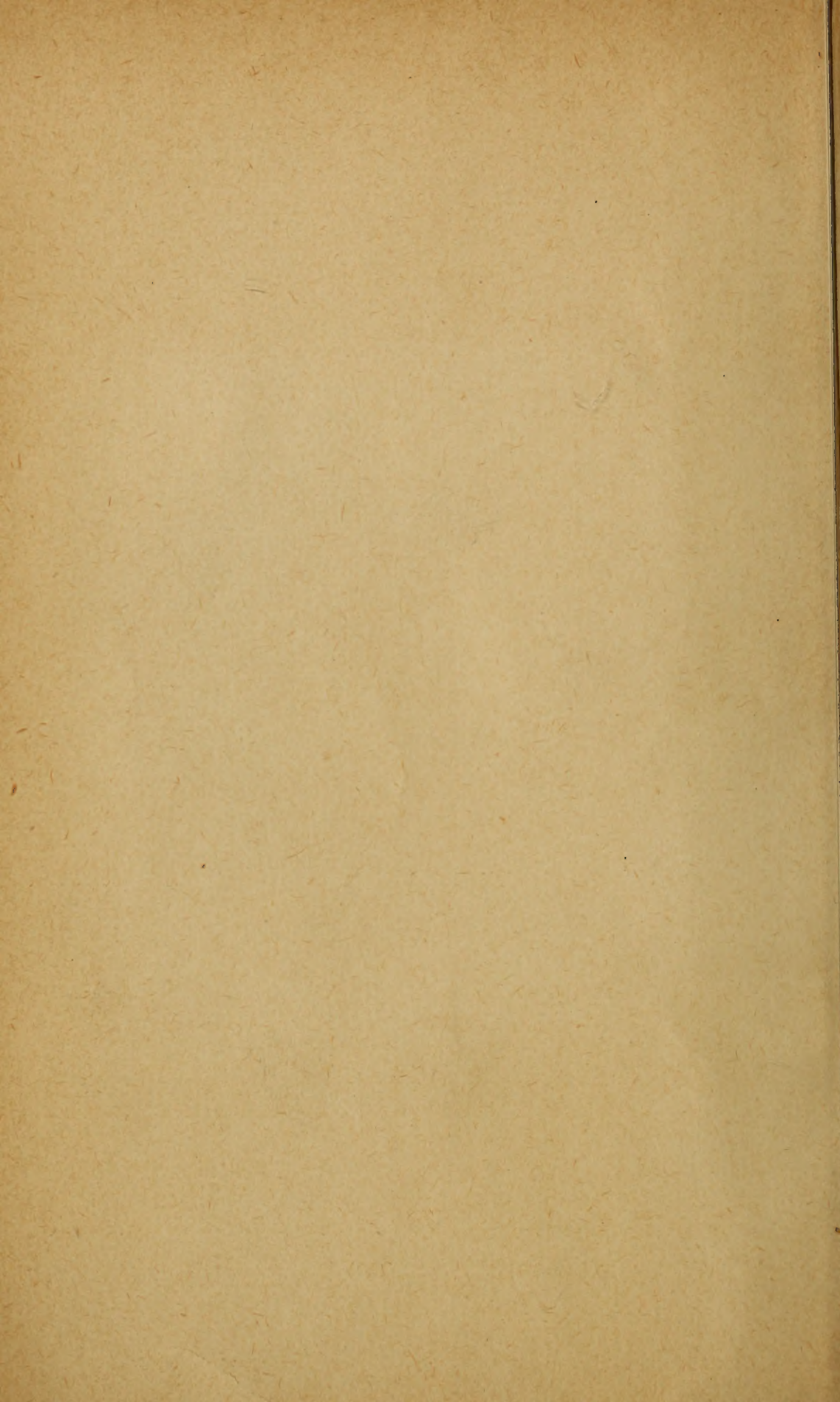


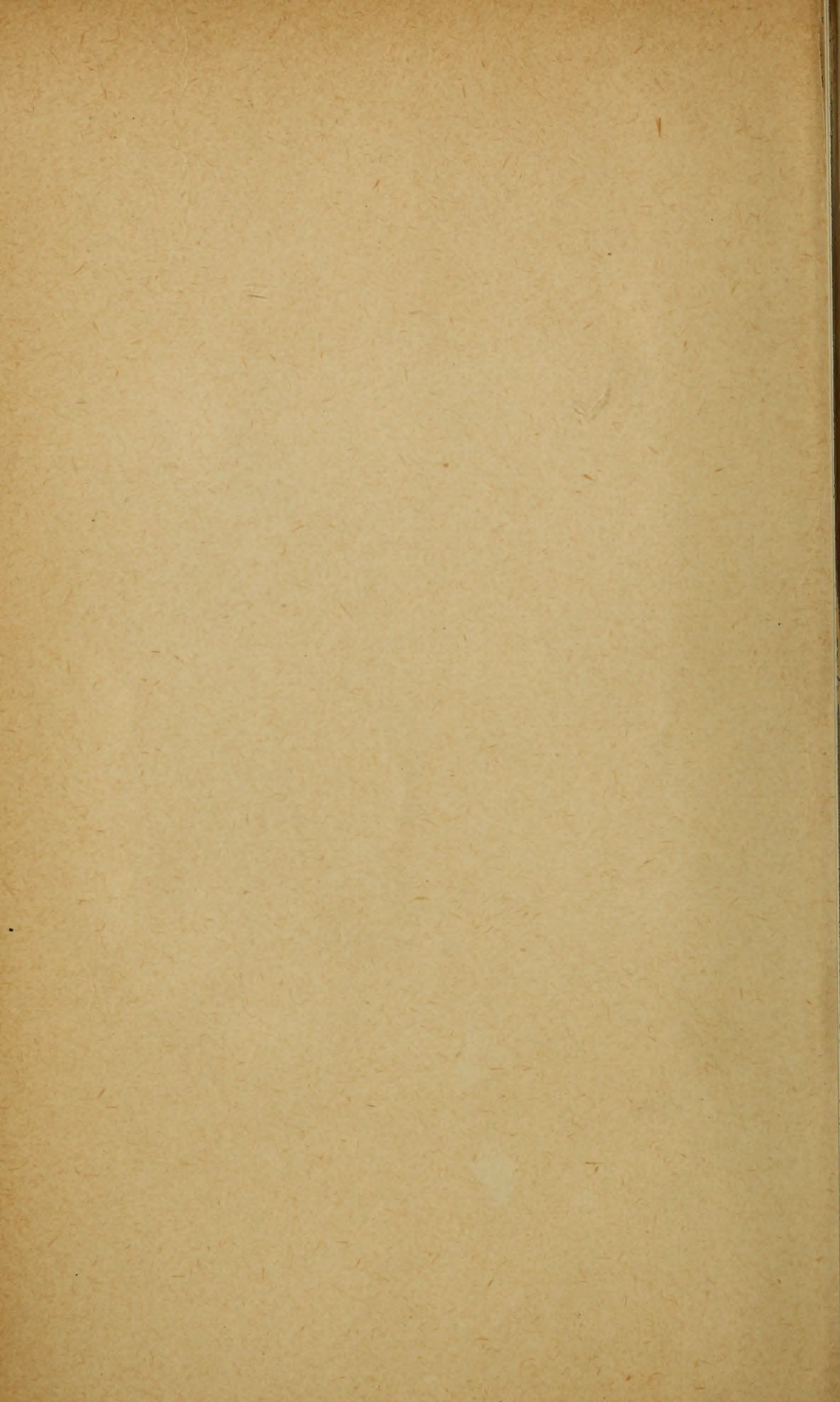
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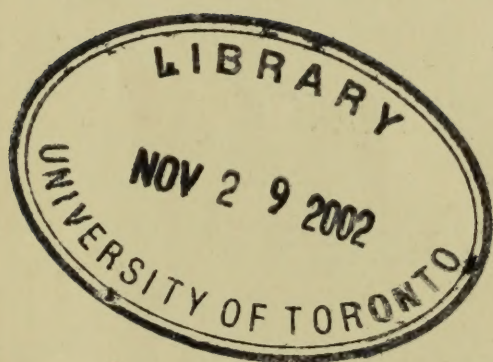
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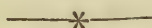
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ORIGINAL COMMUNICATIONS.



*THE MARCH OF SURGERY—SOME LESSONS FROM
AMERICA AND ELSEWHERE.

BY SIR W. I. de C. WHEELER,
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The art of Surgery is as old as the existence of man. The most ancient remains bear the impress of the surgeon's skill. Skulls of epileptics were trephined to afford incarcerated evil spirits a chance of escape. The foundations of our surgical edifice were laid when man first appeared upon the earth. In a paper of limited scope it appears more profitable to deal with the present and think about the future, but we must be guided to some extent by the records of bygone days. Progress was indeed slow in the ages past, if none the less sure; for centuries we find one authority after another preaching the doctrines of his own forefathers.

Some few years ago I had occasion to review the works of Hippocrates and Galen, to search the writings of

*The Presidential Address to the Surgical Section, Royal Academy of Medicine in Ireland, Nov. 26, 1920.

Dupuytren, Hamilton, and Malgaigne, and to see what Velpeau, Wiseman and Ambroise Paré had to say on the subject of fractures. The study was absorbing, and the trail was followed through the great eighteenth century school led by Pott and Hunter to Sir Astley Cooper, Lister and modern times. The result of it all was to find that the Egyptians, three thousand years before Christ, in the fifth dynasty, probably treated fractures by more successful methods than are often employed at the present day. Grooved splints were used in compound comminuted fractures of the shaft of the femur, pads and bandages of linen tied with reef knots secured them in position. Three thousand years later, in the Christian era, treatment was the same, and another two thousand years found the Abyssinians adopting methods in no material way different from those of the ancients. A study of broken bones to its source takes us backwards past definite milestones, for a bone once broken forms a permanent index from which can be gauged the ideas and ability of the surgeons in the past, and from the earliest times there is an abundance of specimens from which this study can be made. Treatment, however, appears to have only undergone a real change in our own time; through the ages it was regarded as a thing like the laws of the Medes and Persians, which altereth not.

In a study of this kind it is disappointing to find that the surgical supermen of the past were obliged to engage in a heart-breaking struggle in their effort to advance. Reaction and conservatism haunted them as they haunt us. There was the inevitable make-believe that the hands of the surgical clock could remain stationary, and then, as now, men with their heads in the sand were content to believe that their own methods, employed in hidden corners, represented the finality of perfection. It is usually from those who have neither travelled nor read that dogma and conceit is expected, but we find so renowned an authority as Ambroise Paré, who has recently been described by Moynihan as one of the greatest original minds our art has known,

“ Fearless, independent, alert and inventive,” referring to himself in these words: “ There be few men of this profession which can bring so much authority to their writings, either with reason or experience, as I can. I have so certainly touched the mark whereat I aimed that antiquity may seem to have nothing wherein it may exceed us, besides the glory of invention, nor posterity anything left but a certain small hope to add some things, as it is easy to add to former inventions.” He little foresaw Lister and the future in cultivating an attitude so detrimental to progress. The quotation is useful to illustrate a condition of mind which is only too common at the present time. Those who described their own work were egoists; praise of the work of others was regarded in the nature of hero worship, and criticisms of faulty, ill-conceived effort were attributed to jealousy. The obstacles to progress appeared always in the ascendancy.

In studying the present age of rapid advance and making plans for the future, surgical progress can be helped by taking to heart certain lessons. If not from day to day, at all events from year to year, the outlook of the operating surgeon must alter. It is no use when young deciding what is best in surgery and developing to the utmost a system based on the work of contemporary leaders in the belief that it will suffice for a lifetime. Think of the manufacture of motor-cars and compare the engines of to-day with ten years ago, the small improvements in carburettor, magneto and essential parts have in a decade produced an almost perfect machine. The danger is that as we grow older and our minds less receptive we may miss in surgery the cumulative effect of small advances.

We learn another lesson by noting the incredulity and scathing disbelief, the merciless and destructive criticism which accompanied such epoch-making discoveries as anæsthesia and antiseptic surgery. Who knows but that we are on the verge of the solution of the cancer problem? All of us have seen the melting away into thin air of masses of cancerous growth under the action of radium;

it is almost past belief that an infiltrating ulcer in the tongue and mouth beyond the possibility of successful operation can be made totally to disappear in a few days, yet such cases are often seen. Truly, it is not a cure, but it prepares the mind for vast possibilities. Although surgery is defeated by metastasis in cancer, in syphilis salvarsan and its derivatives can search every corner of the organism until the virus is rendered inert or finally destroyed. Research is only temporarily baffled; an army of workers are abroad in the laboratories, and clinical observers are everywhere on the alert. How interesting it is to speculate on the connection between a slight injury to bone and the development of sarcoma. We think of the great capillary supply of the cancellous ends of the bones and how a slight injury causing a capillary hæmorrhage within may set free the tubercle bacillus or other organism with results which can be accurately pictured. It is not so long since our ignorance on this subject was complete. We know that the same slight injury, in the same place, in similar individuals, will be followed by a malignant growth, and yet a severe injury causing fracture is neither followed by the one condition nor the other. The case of the breast is perplexing, for carcinoma is very often preceded by injury, elsewhere it seems to be the product of continued irritation. Will the observation that growth in cancer is stimulated by acidity and inhibited by alkalinity lead us anywhere? That hot drinks are probably a cause of no little importance in producing cancer of the stomach requires careful thought.

Bland Sutton wonders if he could fathom the secret of the changes of pigmentation in the plumage of certain birds at the breeding season how nearer he would be to a solution of the problem of melanotic sarcoma. In an address on the surgeon of the future he is delightfully crisp in his denunciation of some of our reasoning powers and biological deductions. A lecturer on anatomy waxed eloquent on the subject of cerebro-spinal fluid serving as a water bed for the brain in order to preserve it from

harmful concussions. Bland Sutton was not convinced—he told his teacher that the explanation was absurd, for the relative bulk of the brain and cerebro-spinal fluid resembled an ironclad in a duck pond. He emphasises the relationship of sepsis and cancer, and contrasts the numerous cases of fatal infection after removal of the colon for cancer with the immunity from infection which follows operation on the abdomen for non-malignant disease. Our methods for preventing infection in the former class are to his mind almost as clumsy as attempts to kill fleas with bludgeons. He alludes to the use of gloves, sterilised overalls, caps, masks and top boots, when a cancerous segment of the colon swarming with bacteria is to be removed as surgical coquetry. In the same strain he describes surgeons as either craftsmen or biologists and credits the former, *inter alia*, with inventions such as the œsophagoscope, “which requires for its successful use a surgeon with the instincts of a sword-swallower and the eye of a hawk.” I do not know how far the experimentalists have carried us along the road, one thing only is certain that if the riddle of cancer is solved in our time and we resemble our ancestors, which God forbid, we will scoff for a generation and allow posterity to have the benefit. To those who would keep on the straight road and move as quickly as circumstances permit, Osler gives admirable advice. Teachers must have a full personal knowledge of the branch taught, not second-hand information derived from books. Men are required to have a sense of obligation, “that feeling which impels a teacher to be a contributor and to add to the stores from which he so freely draws.” To do this it is necessary to know the best all the world over. He will burden an already overladen literature with faulty and crude observations unless he is familiar with the workers abroad. In another essay he tells us that when a man talks slightly of the position and work of his profession in any country, or when a teacher tells you that he fails to find inspiration in the work of his foreign colleagues, in the words of the Arabian proverb, “He is a fool, shun him.” Personal

first-hand intercourse with the men of different lands when the mind is young and plastic is the best antidote against ignorance. Osler tells some home truths. He discusses the weakened receptivity and the inability of men over forty to adapt themselves to an altered intellectual environment. "It is this loss of mental elasticity which makes men over forty slow to receive new truths." It is well to recognise this unpleasant fact and to gain comfort by believing with so great a writer and physician that salvation lies "in living in and with the third decade in company with the younger, more receptive, and progressive minds." Thus it is essential to travel to see the work of others at frequent intervals, to cultivate discriminate reading, and to contribute from time to time useful knowledge for the benefit of others.

Hole and corner surgery will disappear, and playing to the gallery is already dead. "Surgery of the brilliant kind," says Moynihan, "is a desecration. Such art finds its proper scope in tricks with cards, in juggling with billiard balls, and nimble encounters with bowls of vanishing goldfish."

Some dreaming, a little hero worship, and speculation as to what we are aiming at and living for is not unprofitable, but there are many who will desire to approach the subject of surgical progress from a more practical and utilitarian point of view. To do this a fundamental contrast must be drawn between our ancestors and ourselves. Every epoch in surgery is associated in the past with the names of individual men. All, from Hippocrates to Lister, in the great procession answer their names to the roll call, and each one marks a notable period in surgical advance.

That day is passing, and from now on progress will have in all probability little or nothing to do with individual supermen, unless so far as they are the organisers and centre-forwards, so to speak, of a thoroughly efficient team. The art of surgery is now so wide that no one man can expect to be expert in all branches, and yet a knowledge of all branches should, in the interests of science, be brought to bear on almost every surgical or medical case.

The logic of it is that from henceforward work will be best done in teams and groups. Craftsmen and biologists, physicians, gynæcologists, biochemists and pathologists, those skilled in the use of X-Ray, radium and the cystoscope, with sub-divisions such as neurologists, abdominal surgeons and the like, must work as units in groups and teams so that they may fully understand their interdependence, one upon the other, in the search for truth. To some extent such a system pervades the atmosphere in every large general hospital, but it is by no means complete, and the close co-operation necessary to produce real results is everywhere conspicuous by its absence. The private patient is deprived, as a rule, of anything approaching scientific method.

To illustrate exactly what is meant I will give you the impressions left on my mind after visiting the clinics of outstanding surgeons every year regularly, with the exception of the years of the great war, since I was qualified nearly twenty years ago.

It was difficult to understand at first why, for example, the late Professor Kocher of Berne stood head and shoulders above his neighbours and colleagues, men apparently with equal opportunities and a corresponding amount of grey matter. The same could be said of men in England and Scotland, in France, and elsewhere.

In one clinic an immense amount of operative work would daily be completed. One case after the other would reach the operating room as if those responsible for the preparation and anæsthesia could see through closed doors and always be ready at the psychological moment. Seldom at the operation was it found that an incorrect diagnosis had been made. The physician, radiologist, biochemist and all concerned were generally present to watch their observations put to the test. One could see the wheels working in a well-oiled machine. A visit would be paid the next day to some other clinic. A few words with the surgeon perhaps would leave the impression that the coming performance was to be headed by a genius. But in this

case the anæsthetic was not taken well; after the first abdominal incision the recti fought against further interference and there was a delay. The X-Ray photographs did not correspond with what was actually found, some vital point in the blood or urinary examination had been omitted, and those from whom information was required were not forthcoming. When finally the next case was expected in the theatre there was confusion, hurried orders, and the third patient appeared instead of the second. It is just the difference between the work of a well-trained team and the inco-ordinated action of isolated individuals.

So impressed was I with the advantages of such team work that nine years ago, on a very small scale, I started a hospital and a team of my own, and at the risk of being found guilty of egotism I will tell you what it means. The same anæsthetist, the same assistant, a theatre sister who has worked for me alone for nine years, the same nurses, the same light, the same instruments, the same atmosphere and surroundings for every private operation whenever a choice exists. Each one of this small team can now, after years of practice, anticipate every movement, almost every thought of the other, and the work done is never wearisome. Operations are carried out in many other private hospitals by the same team, and instead of giving offence, as was at one time feared, the nursing staffs and all concerned see for themselves and co-operate most loyally with the underlying idea. It is this small and modest experience of my own—a sort of nibble at a great feast—combined with what I saw when the system was developed on a great scale which makes me convinced that no longer should surgery be regarded in any sense as the province of one man. Recently things have progressed far in advance of this team system which could be seen years ago at selected clinics near and far. It is better to refer to the more modern idea as group work, and probably the most perfect group work is carried out in Rochester, Minnesota, under the guidance of those two master surgeons—William and Charles Mayo. I have recently visited Rochester and by

way of showing the direction surgery is now taking, and will take in the future, it might interest those who have not seen it to have a diagrammatic picture of group work as carried out by impressive and model methods.

The population of Rochester is about 8,000, and yet last year 60,000 patients presented themselves for advice. Two men have built up this vast organisation in about twenty-five years. From their earliest days the Mayos have travelled incessantly, and by seeing the work of others and by the exercise of a well-balanced judgment they have imported to their own domicile everything of the best from the surgery of the world. So much for the advantage of travel. The Mayo Clinic building is a new structure of some magnificence, fully equipped with every modern appliance, studded over with chemical and pathological laboratories, and manned by a team of experts about 200 strong. The principal parts of the building are a highly co-ordinated mechanism for investigation by any combination of men and methods that the particular case may demand. The agencies of diagnosis are carried out in every department to the point of perfection, and the results are funded in a bureau of records and statistics which is admirably conceived in plan and elaborately equipped in detail. There is every facility for the study of metabolic phenomena, problems of immunity, and of bacteriotherapy, the histogenesis of pathologic forms, the redundant types of cell growth, the chemistry of disease processes, and the alterations of postoperative function. There are a series of laboratories, with dressing-rooms and diet kitchens attached, for gastro-enterologic analysis and equipped with every practical device for lavage and the isolation of enteric contents.

A system of coloured signal lights ranged along the corridors announces the presence and whereabouts of each leading clinician. The bureau clerks through a system of signals and telephone communications keep in touch with his movements and locate him when wanted. The registering and communicating devices of the bureau suggest a

sort of mechanical detective agency. They give the keynote to the conduct of the clinic, viz., co-operative investigation. Each floor is more or less divided into spaces for clinical observation and laboratory research. Genito-urinary investigations are well provided for. Cystoscopic and proctoscopic examinations are made daily on a queue of patients, and a special Roentgen laboratory is attached to the rooms allotted for this work. Thirty-four rooms are assigned to the X-Ray laboratory, in which diagnosis and research play the larger, and therapeusis the lesser, part. On the third floor there are laboratories of histology, pure pathology, photomicrography, physiologic and pathologic chemistry. There is a sort of Zoological Gardens in the basement, where animals are kept for experimental research, and last, but not least, there is a studio for eminent artists employed by the clinic.

Now let us take a hypothetical case and follow a patient with a goitre from the time she reaches Rochester to the day she is discharged cured. All the particulars are taken down at an office, preliminary forms are filled up, until enough information is obtained to pilot the patient to some junior clinician or laboratory worker. The clinician requires a blood count, and by pressing a button the patient is transferred by a lift to one of the many laboratories. Let us suppose the blood count does not in this case give the lymphocytosis picture to which Kocher attached so much importance as a diagnostic sign in hyperthyroidism. Yet it is believed by the clinician that the case is one of commencing Graves disease. Only slight importance is attached to the blood picture, and many cases of colloid goitre in neurotic girls are mistaken for hyperthyroid cases; the doubt must be cleared, and the patient travels on. By the waft of a wand she now finds herself blowing in and out of a complicated-looking machine having an estimation made of her basal metabolism. It is only in thyroid and pituitary disturbance that the rate of exchange between inspired and expired air is altered from the constant normal; in the blood diseases, malignant disease, etc., the basal

metabolism remains the same. To this test then the very greatest diagnostic importance is attached. From a prognostic point of view, however, it is often found that patients with only a slightly increased basal metabolism respond badly to treatment, and *vice versa*, so the clinical picture is in this respect a better guide. The junior clinician in charge, provided the patient has no complications or other condition apart from the goitre, has now got sufficient data for a *prima facie* diagnosis. When all the preliminary investigation is complete, one of the leading physicians or surgeons, such as Dr. Plummer or one of the Mayos, sees the patient and analyses the deductions made. Treatment is then advised which in this case will be operative. Strange to say, there is a complete agreement between physicians, surgeons and laboratory workers that surgery is the only really successful treatment for hyperthyroid cases. Taking them all in all the mortality is only about 2 per cent. After operation the patient again passes through the laboratories, the basal metabolism has come down to normal, and the blood picture, if altered in the first instance, has now resumed its proper character. It is more easily imagined than described what a fund of scientific information is obtained by such methods.

Once a week *post-mortem* examinations are made and every doctor concerned in the case must be present. The patient may have died after gastrectomy for cancer of the stomach. There is evidence, perhaps, that the X-Ray picture was inaccurate. The radiologist is present and explains the fallacies of his critics. How was it in this case—cancer following chronic ulcer—that no hydrochloric acid was found at one examination and on the same day hyperchlorhydria was reported on the chart? Those responsible come forward and give details of numbers of cases where secretion of hydrochloric acid is inhibited at the time of testing, perhaps from the sight of the tube, perhaps in relation to the time of the last meal. Hence the frequent necessity of fractional gastric analyses and tests at quarter-

of-an-hour intervals when the results of such an examination are considered of importance. So the discussion at the *post-mortem* goes on, until finally the cause of death is attributed to, say, leakage at the line of anastomosis, and the onus is placed then on the surgeon to explain why in this case he had adopted a certain operative technic which had failed.

In the Mayo clinic material is passed through a clinical mill, but the untiring interest shown in the younger co-workers has eliminated the petty quarrels of jealousy, and no politeness stands in the path of investigation which leads to the goal of scientific truth.

It would be impossible in a short time to describe the operating theatres and surgical technic. In a place where team work is a religion it goes without saying, that it is simple, effective, and thorough. From 30 to 40 major operations are performed each morning in six theatres; illuminated signals in the corridors announces the name of each operation as it proceeds. Visitors are thus enabled, without disturbing the operators, to know exactly what variety of work is progressing in each room. The pathological laboratories in immediate connection with the operating theatres are freely used. During operation specimens are constantly passing for examination and the operative procedure is determined by the report received a few minutes later. Great importance is attached by the workers in the laboratory to the examination of fresh living material. The cell picture of sections made on living tissue is often quite different from that shown when dead cells are examined. For example, lymphocytes seen in smear preparations may not be lymphocytes at all, the change of cells into what appear to be lymphocytes is a *post-mortem* effect. The old pathologist is comparable to the anatomist, the new to the surgeon.

Exposure of the gall bladder and ducts is facilitated by passing a large gauze wipe between the liver and diaphragm and rotating the liver like a balance on a knife edge. The liver easily topples over and presents its under surface by

the aid of this simple device. In massive tuberculous peritonitis in the female the abdomen is opened and the finger is inserted through adhesions into the pelvis, a line of cleavage is found and—*mirabile dictu*—after a little manipulation, reminding one of prostatic enucleation, the Fallopian tubes—the *fons et origo*—appear in the conjuror's hands. There is no cutting or blunt dissection and no ligature is used. These cases do excellently well.

The Talma-Morison operation for ascites is combined with splenectomy, for in this way 30 to 50 per cent. of the total blood is prevented from ever reaching the liver. Splenectomy was tried some years ago in cases of pernicious anæmia, but the results at that time did not justify the continuance of the operation. After a long interval, however, certain cases reported themselves and had recovered sufficiently from the disease to justify the question being reopened. The bias is at present rather in favour of operation. The blood picture did not much change in the five cases which were considered good results in a total of fifty splenectomies for pernicious anæmia and leukæmia. I am writing from memory on this point and those interested must verify it.

Transfusion of blood is done extensively; there is a roster of blood-givers in the town. Pain in the back is one of the first signs of reaction, and if this occurs the transfusion is stopped. Even with proper grouping, reaction and death has occurred. The cause of this reaction is not known, but careful investigation is proceeding and the problem is not likely to remain unsolved. A case of pernicious anæmia is transfused once a fortnight; one case had forty transfusions. They all die in the end, but the treatment is well rewarded by marked temporary improvement.

The Gasserian ganglion operations appear to the onlooker like minor work; there is no blood, no shock, no hitch. Adson, who is probably not more than 30 years of age, is responsible for surgical neurology. The patient is anæsthetised, as is the custom, by a nurse. He is placed almost in

a vertical position, his head being on a level with the head of the operator standing on the floor. A straight incision is made half an inch in front of the ear, the lower extremity being on the zygoma. The skull is then opened with Hudson's drill and the opening enlarged with nibbling forceps. A little cerebro-spinal fluid is withdrawn to render easier the lifting up of the dura. The middle meningeal artery is tied and the dura propria is incised. The afferent root is divided with a specially constructed guillotine and the operation is over. The ganglion is not avulsed nor interfered with, no trophic disturbance follows the operation, therefore the trophic centre may be in the ganglion or peripheral to it. Anæsthesia follows in the cornea as is to be expected, but there is never a recurrence of symptoms.

One could proceed *ad infinitum* mentioning points of interest, how the active principle of thyroid secretion was discovered almost by accident in the laboratories after examination of some tons of thyroid obtained from meat factories. This substance administered to hypothyroid and myxodæmatous patients produces results far in advance of any other known preparation, but it is much too expensive for general use. Efforts are now being made to produce it synthetically.

Radium is used a week before operation in suitable malignant cases, the interval between application and operation is short owing to the adhesions and cicatrix found when a longer time is allowed to elapse. Very small capillary glass tubes are often used containing half a millicurie of radium emanation, and these are left permanently *in situ*.

I was in a laboratory when a demonstration was being made showing that thyroid extract produced by one firm had five times the iodine content of that produced by another. Some popular preparations were useless because bacterial action had probably destroyed the active principles in the drying process to which the gland was subjected.

What a lesson to ponder over when we write prescriptions

containing the names of drugs, perhaps potent, perhaps not, but always with hieroglyphics and symbols, and thus we carry on the old idea of mysticism associated with the medicine of mediæval times.

“ You humbugs of doctors,” says one of Charles Reade’s characters, “ couldn’t speak plain to save yourselves from hanging.”

“ After fifteen years given to the science of obscurity Mr. Sawyer literally could not speak plain in one moment.” It is suggested to the reader that the science of *Æsculapius* is guess work, but the patient “ goes on hoping and hoping something from traditional remedies, even when they fail and fail and fail before his eyes.” The surgeon is pictured at each visit feeling the pulse and writing a prescription, “ for it is a tradition of the elders that at each visit the doctor must do some overt act of medicine.” Thus thinks the man in the street, and he is justified to some extent in doing so.

Already I have trespassed too much on your time and patience, and yet I have only touched on the fringe of what I wished to convey. As surgeons we must know anatomy, which remains the same; advances in physiology, pathology, biochemistry and the allied sciences will guide us on our forward path.

Ireland produced great men when individuals counted. Graves, Stokes, Tuffnel, Butcher, Corrigan and Colles are almost all within our memory. Let us hope that in the future great teams and groups will arise so that we may actively engage with others in the contest against disease armed with the irresistible weapon of conjoint action.

I have quoted freely from the work of those who have given and are giving us inspiration. In conclusion I will give the last two lines of Bland Sutton’s address on “ Science and Surgery ”:

“ Before all things let us remember that fellow-craftsmen should not be competitors, but comrades of the same honoured craft and guild.”

THE ADVANCE OF OBSTETRICS.

By PROFESSOR HASTINGS TWEEDY.*

Fourteen years have passed since I had the honour of occupying my present position as President of the Obstetrical Section of the Royal Academy of Medicine in Ireland. On that occasion I dealt in my Presidential Address with recent progress in gynæcology. It is interesting to note that I mentioned in this address for the first time my method of preparing the skin before operation with a spirit solution of picric acid. The fact that this plan has now received wide adoption is eloquent testimony to the influence exercised by our Sectional Meetings on medical thought.

To-night, with your permission, I shall deal with obstetrics, the progress of which has been at a still more rapid rate than that of its kindred art. It is no exaggeration to state that means are now at our disposal capable of lowering the maternal death-rate by 50 per cent. as compared to those available in 1904, the year in which I became Master of the Rotunda Hospital, and if the death-rate can be so much lowered a still larger percentage of women should pass through the processes of labour uninjured by the ordeal.

Our Section has taken a prominent part in recording this advance, but despite its efforts there are few who realise the progress which has been made.

In conversation with an eminent member of our profession, I recently elicited the following admissions:—
(1) He considered that no material improvement had taken place in obstetrics since his hospital appointment.
(2) He was teaching now as he taught 14 years ago, and
(3) he was practising the art as he had practised it 17 years ago. In these sentiments I fear he voiced the minds of many, for even in great maternity institutions there still exists a conservatism which can only be considered amazing.

*The Presidential Address to the Obstetrical Section, Royal Academy of Medicine in Ireland, November 12, 1920.

In 1904 the principles of aseptic obstetrics were as well understood as they are to-day. The Rotunda was administered by a capable and energetic staff, who were proud in the belief that no kindred institution could show results comparable to theirs, yet the hospital viewed from present-day standards was unhealthy, and close inspection revealed much which could with advantage be altered. (1) Gloves were not in general use, and their introduction was much resented by the Junior Staff, who considered that an innovation so new was fraught with considerable danger. (2) We substituted dry cotton wool diapers for the very objectionable linen ones which we found in use. The latter were wrung out of 1 in 1,000 corrosive solution and applied wet to the buttocks. The warm moist application was inimical to healing. The solution often inflamed the buttocks, and, of course, ceased to be antiseptic when mixed with blood. Further, the diapers came from the laundry in a doubtfully cleansed condition. Their employment could not be excused. (3) We found that there existed no fixed position in the ward for each bed, and that when the wards were turned out for cleaning the beds lost their identity. This was true to a still greater extent as regards chambers, bed-pans, etc. A bed-pan had to do service in several beds, and disinfection in corrosive sublimate solution was considered sufficient preparation for it before use. This latter proved inadequate, and we traced a very severe attack of sepsis to its failure. Clearly the conditions present made it difficult to trace septic attacks to their origin and hard to circumscribe the area of infection. Morbidity lessened from the day on which we adopted the present plan, viz.: all that appertains to a bed is now considered as one unit, strictly confined to its own position in the ward. In addition it has become a routine custom to steam sterilise all the paraphernalia of the bed immediately on its being vacated.

Grave fault was to be found with the morbidity index

as it then existed. It was most unreliable, and resulted in the discharge from hospital of many who were unfitted to be removed. In adopting a new criterion I was greatly assisted by the present Master, Dr. Fitzgibbon, my Assistant. It is to his suggestion that we owe the inclusion of the pulse rate, used in conjunction with the temperature. After much consideration we decided to consider a woman unhealthy should her temperature rise to over 99F., whilst at the same time her pulse rate exceeded 90, provided the abnormal state continued for a period of 24 hours. Patients who were considered morbid were not permitted to leave hospital until a normal standard was shown for 24 hours. The exceptions to this rule were so few that they need not be specified here.

There is no need to dwell on other changes; they have been carefully recorded in our hospital reports, and they succeeded in lowering the septic mortality by over 50 per cent., and still more important, the morbidity from 10 per cent. to 4 per cent. To what extent other hospitals have followed or improved on our methods I have no means of ascertaining, for one seldom sees administrative changes referred to in hospital reports. Were such references recorded, material of extraordinary interest would be within our reach. Results such as I have indicated form a curious commentary on the recent introductory address at the Oxford meeting of the British Medical Association, where it was suggested that present-day sepsis was chiefly a matter of auto-infection.

Only a rash man would declare that our present system of asepsis is perfect. I believe it still leaves much to be desired, and at no time have the Rotunda statistics given any warrant for the belief that auto-infection is of common occurrence.

The infection which may be pushed from the vulva to the cervix by the examining finger should not be considered an auto-infection.

I must here emphasise the truth that every degree of lessened morbidity occurring in an institution like the

Rotunda means the probable saving of at least one life per year, coupled with a notable shortening of the average number of days spent in hospital; and again, abnormal temperature during the lying-in period is followed in many instances by permanent ill-health.

Accidental Hæmorrhage.

The discovery that accidental hæmorrhage may arise as a consequence of toxæmia and the further discovery that hæmorrhage is often poured into the abdominal cavity rather than into the uterus, are findings of far-reaching importance.

This complication of pregnancy has ceased to be a serious menace when treated by the Dublin method. In the ten years in which I was Master and Acting Master of the Rotunda we had 72 such hæmorrhages, with two deaths. The latter occurred as a consequence of concealed intra-abdominal bleedings. Had our knowledge then been as complete as now, these lives would almost certainly have been saved by Cæsarean section. The 72 cases were all of the more severe type, a statement readily understood when I add that they were all which were recorded amongst our 18,000 deliveries.

Evidence in favour of the vaginal plug is now conclusive, and I know of no published statistics comparable to ours, yet the Dublin plan has received no general approval, and few have realised the manner in which the plug acts, nor acquainted themselves with the method of its proper application.

Hysterectomy is still adopted for the cure of accidental hæmorrhage, and with disastrous results in cases where a plug would prove effective or Cæsarean section suffice to ward off death.

Eclampsia.

The Dublin treatment of eclampsia has reduced the mortality of the disease to below 5 per cent. If I am to take my last series of 51 cases treated in hospital and

in private practice I have had but one death. Such success is only possible when treatment is carried out as a routine procedure in every case and with a strict attention to detail. There is no longer room for the suggestion that each case should be treated on its merits, for so long as one woman is bled, another receives saline solution, another barley water, whey, or glucose, whilst yet another has alkaline infusion withheld because of the presence of polyuria, mortality must remain high.

We have reached precision in treatment and, better still, in the prevention of eclampsia. A fortnight ago I was asked to see a lady seven months pregnant, suffering from acute œdema, vomiting, partial blindness, high-coloured scanty urine, solid with albumen. This lady was obviously on the verge of eclampsia, yet at the end of six days of absolute starvation, symptoms had greatly abated. Œdema had practically disappeared, eye symptoms were better, albumen much less, and nine pints of light-coloured urine were voided in twenty-four hours. We decided then to allow a small quantity of nourishment, and accordingly permitted one half pound of grapes. A serious relapse resulted, thirteen pints of dark-coloured, highly-albuminous urine were voided within the following 24 hours, and the condition compelled us to undertake immediate induction of labour. After delivery the patient's state improved, and has since followed a favourable course. Surely we are justified in believing that this lady's life was saved by prompt starvation.

Other toxæmias, *e.g.*, hyperemesis, pregnancy vomiting, salivation, etc., are also amenable to methods which have proved effective in eclampsia, and it is probable that the toxin causing acute yellow atrophy could be rendered harmless by similar methods.

Obstructed Labour.

The treatment of obstructed labour has gained by the introduction of pubiotomy and lower seg-

ment Cæsarean section. The precision with which the intern diameter of the brim can be measured enables us now to determine treatment with accuracy. Each half inch diminution in the conjugate diameter gives its own indication of operative procedure. The first half inch (flattened pelvis), normal delivery, with forceps or version according to complications. Second half inch, induction of labour or pubiotomy. Third half inch, Cæsarean section for choice; pubiotomy, if labour is far advanced, or pubiotomy sometimes with induction of premature labour. Fourth half inch and all smaller measurements, Cæsarean section.

Those who follow these rules are no longer beset by exhausting difficulties which in time past constituted an obstetrical nightmare. Classical Cæsarean section will in future be reserved for emergencies where speed is an important element. For all other conditions I believe the lower segment section, as modified by Munro Kerr, will constitute the operation of election.

Classical section is at present conducted with a reckless disregard of essentials. It is still a dangerous operation, both in immediate and after effects, and has been made to cover much ignorance in obstetrics.

Time does not permit of a more detailed survey of progress. I can but allude to the better results obtained in treatment of ruptured uterus by plugging the rent with iodoform gauze, bunched in the manner of a housemaid's duster rather than by the more spectacular method.

Those who doubt the above statement are referred to our hospital statistics.

Septic Mortality has diminished since the introduction of polyvalent serum, autogenous vaccines and the continuous rectal drip.

Myomectomy performed during the pregnant state has been proved to be a safe and satisfactory operation, less harmful to the woman and more beneficial to the infant than the older procedures.

Turning to the altered conditions which now prevail in

our private practice as compared to those of fourteen years ago, a great change for the better has occurred. Midwifery is no longer the wearing, anxious, life-destroying and ill-paid pursuit which it formerly was.

Three influences have combined to bring about the change:—(1) The popularity of the Maternity Home; (2) the introduction of scopolamine, and (3) the employment of pituitrin.

I have often stated that patients attended in private houses did not on the whole run the same uneventful course as those seen in hospital practice. The reason is obvious. In a private house basins, jugs, etc., are rarely aseptic. Help is insufficient and not always wise; the couch unsuitable and the light indifferent. Added to these disadvantages, the frequent appeals on the part of anxious relatives and of the patient for help are calculated to induce a premature and unnecessary interference, and that in the midst of most unfavourable surroundings.

The conditions are reversed in the Private Home, and an ideal state of isolation is maintained.

The prejudices which I formerly entertained in respect to scopolamine and pituitrin were entirely removed by monographs read at our obstetrical sections by Drs. Sheil, Freeland, Solomons, Allen and Madill. Their conclusions, based on a large series of carefully-observed cases, convinced me of the safety and efficiency of the drugs when used with a due consideration as to their indications.

A patient who now falls into labour during the night hours is urged to remain quiet and sleep between pains. To this end the matron (not the midwife) is permitted to administer hypodermically quarter grain of morphine. The matron of the Home telephones at breakfast hour to me to announce the fact of labour and to report progress. I endeavour to make an early call, and if desirable give a hypodermic of one hundredth of a grain of scopolamine without morphia. This dose I divide into two unequal portions. The first amount injected being

not more than one one-hundredth-and-twentieth of a grain, to be followed by the remainder in a quarter of an hour, if no marked effect has resulted.

Similarly, if it is desired to increase uterine effort, one-half c.c. of pituitrin is injected, again in divided and equal doses. This division of doses guards against undue susceptibility, should it exist. I seldom see my patient again until summoned for the actual delivery. If not summoned, I pay an evening visit and repeat the pituitrin if necessary. Labour is almost always completed before the night, either naturally or by application of forceps.

The use of forceps is a troublesome, anxious and far from safe operation when carried out in a private house. On the other hand, there is no objection to be urged against its employment where surroundings are aseptic, light good, help ample and all other conditions favourable.

With normal delivery under these ideal conditions I have no anxiety, for convalescence is invariably uneventful, and the auto-infection of which we have recently heard so much does not occur.

In another respect practice has become much less exacting in that we can now with remarkable accuracy determine the date of labour. Many women carry their infants over time, and this is a disadvantage to the mother and a danger to the child. A big foetus runs grave risks during birth, and the maternal structures are apt to be unduly torn or stretched.

If, then, labour can be stimulated to start at full term, considerable advantage is obtained.

This can be done in 50 per cent. of cases by administering one oz. of castor oil in the early morning on an empty stomach, to be followed in an hour's time by 10 grains of sulphate of quinine. One-fourth c.c. of pituitrin given hypodermically at 10 o'clock in the morning increases the chances that labour will start. If these drugs fail no harm is done, and they should not be again administered

for a full week. They will not succeed in inducing labour until the woman has arrived at full term.

I have now covered the chief causes of maternal mortality, and it is clear that my claim to a reduction of 50 per cent. is no exaggeration.

To those who regularly attend our meetings the changes which I have indicated will not cause surprise, but many other less fortunate brethren will receive my statements with incredulity.

To the latter I suggest a study of the literature which will be available to them on the day on which they become Fellows of the Royal Academy of Medicine in Ireland—the only avenue by which the Dublin School can make itself articulate.

A CASE OF TETANUS.

BY C. J. MACAULEY, M.B., DUBLIN.

On the 21st of October, 1919, I was called to the suburbs of Dublin to see a boy, aged 16, with the following history: While playing in the garden in his stockinged feet he sustained a small scratch on the outer border of his left foot, to which he paid no attention. Nine days later he began to complain of pain and stiffness in the small of his back; a few hours later he developed pain in the back of his neck, and on the next day trismus. That night he got a tetanic spasm and a doctor who was hurriedly summoned administered 1,500 U.S.A. units directly into his spinal column without withdrawing cerebro-spinal fluid. This was late at night and was the only supply of antitoxin available. The patient passed a bad night; he had several spasms, and the intervals were becoming shorter. In the morning his doctor gave him another 1,500 units, this time intramuscularly. I saw the boy shortly afterwards, *i.e.*, two days after the onset of symptoms. He was rigid, cyanosed, and sweating profusely. His hands and arms were quite lax,

but the muscles of his back, his neck, and especially his abdominal muscles, were very tense. He complained of great pain in his back, and his breathing was noisy, laboured and mucoid in character. While I was present he developed a typical tetanic spasm, trismus and risus sardonicus being well marked.

The scratch on his foot had a curiously unhealed appearance, but was not inflamed or suppurating.

He was immediately transferred to hospital by ambulance, being kept under the influence of chloroform all the way.

Hospital Treatment.

- I. Nursing—Darkened room, special nurses, and careful feeding with egg-flips, broths, etc.
- II. Drugs—Morphia, had very little effect. Chloretone (gr. 20), and digitalin for his cardiac irregularity, as suggested by Dr. H. F. Moore, had a marked sedative effect.
- III. Excision of the wound—to prevent any further supply of toxin reaching the central nervous system—was carried out a few hours after admission.
- IV. The elimination of the toxin was promoted by free purgation and diuresis.
- V. Serum treatment for the purpose of neutralising the toxin which had already reached the C.N.S. was carried out as follows:—
 - 1st Day—3,000 U.S.A. units—intrathecally.
 - 3,000 U.S.A. units—intramuscularly.
 - 3,000 U.S.A. units—subcutaneously.

This was in addition to the 3,000 units he had received before admission.

2nd Day—3,000 units—intrathecally.

6,000 units—intramuscularly.

The spasms were now becoming less frequent.

3rd Day—10,000 units—intramuscularly.

3,000 units—subcutaneously.

The spasms were now well under control.

4th Day—3,000 units—intramuscularly.

4,500 units—subcutaneously.

No spasms. Trismus and abdominal rigidity still marked.

5th Day—3,000 units—subcutaneously.

The trismus was becoming less marked.

As the patient now appeared to be out of danger, serum treatment was discontinued. He had received altogether 45,000 units of serum.

The condition of his lungs was now causing me some anxiety and I asked Dr. O'Callaghan to see him. He found he had broncho-pneumonia, apparently due to aspiration, following the rigidity of his neck muscles. He had a stormy time for another week, after which he gradually recovered, ultimately leaving the hospital quite well.

In connection with the administration of serum in this case, two points need comment:—

1. Intravenous injection was not tried, owing to the fear of anaphylaxis.

2. The intraspinal doses were smaller than I should have liked, but as only the dilute serum was available the administration of larger doses, which is rendered possible by using concentrated serum, was difficult.

Finally, in view of the statement that when the incubation period is under 10 days, only 4% of cases recover, the survival of this patient is rather remarkable.

NOTES ON A PSAMMOMA OF THE DURA MATER.*

BY W. D. O'KELLY, M.D., D.P.H.

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Psammomas, or brain-sand tumours, are of sufficient rarity to justify their being placed on record. They are

* Communicated to the Pathological Section of the Royal Academy of Medicine, November, 1920.

usually found springing from the dura or growing from the choroid plexus, but are not found exclusively in these situations. They may be single or multiple. Microscopically they appear to be perithelial endotheliomas, shewing varying degrees of calcification.

The present specimen was found accidentally, *post-mortem*, in a middle-aged man, and it was not possible to ascertain if it had caused any symptoms during life. The tumour was hemispherical, about one inch in diameter, of firm consistency, and greyish-white. It sprang from the under surface of the dura mater, about one inch to the left of the middle line, and pressed upon the posterior portion of the left frontal lobe.

On microscopical examination the tumour is seen to consist of whorls of endothelial cells, many of which have one or more vessels in their centres. These vessels often shew red corpuscles in the lumina. They are lined with one or more layers of endothelial cells, outside which is a varying amount of laminated hyaline material staining red with Van Gieson's counterstain. This hyaline material passes sharply into the endothelial cells of the whorl. In some areas the endothelial whorls are practically absent, only bundles of vessels with hyaline walls being visible, the appearance being cylindromatous. Here and there through the sections are deposits of lime-salts. Some of these are dense, spherical, and shew no structure. Others less dense shew a concentric arrangement, the deposit being heavier at the periphery. In still other areas the genesis of the condition can be seen, granules of lime-salts of varying size being visible in the hyaline portion of the vessel-walls. The tumour is therefore to be regarded as a perithelial endothelioma, resembling in places a cylindroma, and owing to the lime-salt deposition is of the variety called psammoma.

REVIEWS.

The Dublin University Calendar for the Year 1920-1921.

Dublin: Printed at the University Press and Published by Hodges, Figgis & Co., 20 Nassau Street, Dublin, 1920. 8vo. Pp. 60*+495+cxxv.

THIS volume includes, in addition to the usual contents of Volume I. of past University Calendar, a continuation of lists given in the special supplemental volume for the academic year, 1912-1913; and also a section showing the present status of Trinity College as to numbers as well as a list of Parliamentary electors registered in 1920 up to June 30th. This list includes 178 names.

It is gratifying to observe that the numerical strength of Trinity College has risen to that of pre-war times. The total number of students on the College Books under the Degree of M.A. is now 1,268—women, 231; men, 1,037. This is a most satisfactory advance on the corresponding numbers for 1917-1918 and 1918-1919—721 (the mid-war low water mark), and 777.

An item of interest to the medical profession is the fact that on July 1st, 1920, there were 92 students in Medicine who were not on the books in Arts. Some of these students, however, have already obtained the B.A. degree, for their names appear in the list of Parliamentary electors.

Colloids in Biology and Medicine. H. BECHHOLD. Translated from the Second German Edition, with Notes, by J. G. BULLOWA, A.B., M.S. D. Van Nostrand Co., New York. Pp. 464. 54 illustrations. Price 31/6.

THE tremendous development of colloidal chemistry during the present century is due to the realisation of the widespread importance of the subject, following upon the illuminating researches of W. B. Hardy in 1899.

The extent of the field of investigation may be judged

from the admirable and marvellously cheap reports published yearly during the last three years by the British Association under the title of: "Colloid Chemistry and its Industrial Applications." In these reports the reader turns from the subject of fermentation to cements, from fuel to biochemistry, until he is tempted to say, with Macbeth: "What; will the line stretch out unto the crack of doom?"

The importance of colloid chemistry is due to the fact that colloids are of universal distribution and are present in plants, animals, and many manufactured products.

All the physiological processes found in the human body occur in complex colloidal systems, and a correct understanding of the elementary properties of these systems is necessary for a scientific conception of physiological and pathological changes in the organism.

Professor Bechhold's book, translated by Professor Bullock, is an attempt to collect and present the facts of colloidal chemistry that chiefly concern biology and medicine. In this he succeeds, in spite of the difficulties due to the nature of the subject, which is young and growing rapidly.

The first part of the book is a carefully-arranged introduction of over a hundred pages. The chapter on methods of colloidal research is up-to-date and well illustrated. The second part is devoted to "Biocolloids" and deals with the colloidal aspect of proteins, fats and the like. The chapter on Lipoids is scanty, both from a chemical and a colloid standpoint, but the following chapter on proteins is good. As might be expected, the author is much influenced by the doctrines of Brailsford Robertson, which tends to an over-emphasis of the physical side of the subject at the expense of the chemical side. Sorensen's recent monograph on the osmotic pressure of protein emulsoids presumably appeared too late for inclusion.

The latter portions of the book, dealing with what may be termed colloid physiology, will be novel to many readers in this country. The subject suffers somewhat in continuity owing to the great number of isolated facts discovered, but

will be of service to medical workers as being one of the first comprehensive accounts of the subject, and will be a useful supplement to Bayliss's classical text-book. A short chapter on microscopical technique completes a volume of nearly five hundred pages, well produced and illustrated, and altogether a most valuable contribution to contemporary medical science.

W. R. F.

A Course of Practical Physiology. By G. A. BUCKMASTER and H. R. B. HICKMAN. Wright & Sons, Ltd., Bristol, 1920. Pp. 138. Price 5/- net.

AN up-to-date little book by the Professor of Physiology at Bristol, designed, apparently, to precede or supplement the class-books on biochemistry.

There are several features. Many experiments on the frog are omitted and instead experiments applicable to the human subject are introduced. This has much to commend it. Too many courses of practical physiology ignore such important exercises as the use of the stethoscope, and the elementary experiments on hearing and other special sensations; the student is supposed to collect such information during his hospital work.

The book is concise and emphatic, but has several textual ambiguities which may lead to confusion: "The current flows outside the battery from the positive pole to the negative pole, and inside the battery from the negative to the positive (sic)." In the estimation of urea on page 112 the strength of the enzyme solution is apparently left to chance, or the student. We also note that the authors retain the use of that abominable reagent, ammonium sulphide, in the preparation of reduced hæmatin (hæmochromogen). A trial of sodium hydrosulphite, as advocated by Halliburton, is generally sufficient to result in its inclusion as a general reagent.

For elementary class work this book should be very useful: it is portable, and well provided with blank pages for notes and designs.

W. R. F.

Midwifery by Ten Teachers. Edited by COMYNS BERKELY, RUSSELL ANDREWS, J. S. FAIRBAIRN. 2nd Edition. Arnold, London. 1920. Pp. 743.

IF the above volume represents the opinion of *Ten Teachers* their unanimity is as remarkable as it is rare in medicine. A pleasing and notable feature in the new edition is the chapter on Ante-Natal Hygiene. The clear and concise summary of the physiology of digestion which opens the section on the "Toxæmias of Pregnancy" marks a new departure in the treatment of this subject in most text-books. In a book written ostensibly for the student more stress might have been laid on the necessity for frequent auscultation of the foetal heart during the second stage of normal labour, and its importance, as an essential guide to foetal prognosis during that stage, pointed out to him.

In the section dealing with the treatment of puerperal sepsis the distinction is not very clearly made whether the accoucheur should adopt active intra-uterine treatment in all cases of sepsis, or only in very definite cases of sapræmia. However, these are the only small matters which call for comment in an excellent book.

The *Ten Teachers* are too modest in claiming only final year students for their readers, the volume ought, and will, appeal to a large number of practitioners who desire to possess a very readable and reliable work on the important subject of obstetrics.

The Coolidge Tube. Its Scientific Applications—Medical and Industrial. By H. PILON. Authorised translation. London: Baillière, Tindall and Cox, 8 Henrietta Street, Covent Garden. 1920.

Not only radiologists, but the general public, are already becoming familiar with the Coolidge Tube. Its advent marks an epoch in radiography and radio-therapy. M. Pilon's book, explaining its principles and giving an account

of its modifications and the experimental work done in connection with it, is therefore acceptable.

The book is divided into three parts. The first deals with the nature of the tube, its different models and the accessory apparatus for heating and controlling the cathodal filament.

Part 2 gives an account of experiments directed to examine the properties of the tube and its radiation. An interesting chapter deals with the emission of x -rays from points other than the focal spot. This was investigated by pinhole photography of the anode, and though of scientific interest is not of practical importance in radiography. Moreover, these vicarious radiations can be screened off by means of an ingenious method of hooding the anode. The fixity of the focal point, however—a matter which is important, is shown to favour the Coolidge Tube against other patterns.

The last part may be described as an apology for the Coolidge Tube, answering satisfactorily several groundless criticisms. The wonderful flexibility of penetrative power is well illustrated by radiograms of such diverse objects as small insects and steel weldings. Some experiments and suggestions concerning the protection of the operator conclude the volume.

We have not seen the book in the original French, and are disposed to think it has probably lost somewhat in clarity of expression in the translation; it is well illustrated, however, and on the whole may be described as a clear and complete account of the subject.

W. G. HARVEY.

Induction Coil Design. By M. A. CODD. With 169 illustrations, including 14 plates. London: E. & F. Spon, Ltd., 57 Haymarket, S.W. 1. New York: Spon & Chamberlain, 120 Liberty Street. 1920.

It is doubtful if a book of over 200 pages on induction coil design will appeal to a large public. Those, however, who

are sufficiently interested in the working of coils to read through Mr. Codd's volume will, we are sure, derive satisfaction. It is an excellent book. Written by a thorough master of his subject, and profusely illustrated by photographs, drawings, charts and graphs, it might appear at first glance to be for experts only. It is, however, so simply and clearly written that it is readily intelligible to those who have but the most superficial knowledge of coil construction.

Mr. Codd rightly insists that the action of a coil should be regarded not merely in the light of ordinary electro-magnetic phenomena, but also as partaking of the nature of high-frequency effects. The importance in *x*-ray production of the peak as compared to the rest of the curve is well demonstrated.

Separate chapters are devoted to the core, the primary winding, the secondary winding, the condenser and to interrupters, while further chapters on measuring instruments, coil-testing, insulators and coil design conclude the book. The Coolidge Tube receives its share of consideration.

The requirements of radiographers and of wireless operators are dealt with. Alternative methods of current conversion such as the Snook machine are not described, being outside the scope of the title, and there is little doubt but that the coil is once again coming into preference for *x*-ray work, it being now recognised that the high milleampereage of the interrupterless machines is not synonymous with efficient *x*-ray production.

We commend this book to all interested in its subject.

W. G. HARVEY.

A Manual of Obstetrics. By J. C. HIRST, M.D. 216 illustrations. Published by Saunders & Co. 1919. 14/- net.

THIS book is well written and contains numerous illustrations. The author considers the entire subject of obstetrical hæmorrhage in one chapter; his treatment for placenta prævia (7th month), central or partial, is podalic version, in

the description of which he emphasises the need for stringent asepsis, also recommending the manual dilatation of the cervix in these cases, a procedure which we would regard as somewhat dangerous, owing to the liability of extensive laceration of the cervix. In view of this his concluding sentences in this paragraph are significant—" Unless the physician is confident of his ability to perform the dilatation and version *quickly* (the italics are ours), he had better not attempt it." " Too rapid extraction of the child may rupture the uterine segment, and this rupture spontaneously is not rare." Surely, therefore, in a uterus in this condition it would seem extremely inadvisable, to put it mildly, to attempt to dilate the cervix at all. How much more, therefore, ought a quick dilatation to be deprecated?

The author goes on to consider accidental hæmorrhage external and concealed. Under the heading of treatment he states that—" Vaginal packing is useless in controlling the hæmorrhage." Presumably he means in either case. He advocates manual dilatation followed by version or forceps, and in some cases abdominal Cæsarean section, and if necessary removal of the uterus. The technique of replacing a retroverted uterus is well described and illustrated, and the examination of patients six weeks after delivery and the correction of any existing displacement is advocated. In his chapter on obstetrical operations, the author makes a statement that cannot be too strongly emphasised. :—" There is a greater chance of infection in obstetric cases than in any other surgical case. The nearer an obstetric case is managed like a major surgical operation, the better will be the immediate and remote results."

This book, although differing somewhat in its teaching from that of the Dublin School, contains much valuable information.

R. E. T.

ABSTRACTS OF CURRENT LITERATURE.

MEDICINE.

LAUBRY and ESMEIN : *The Heart Sounds in Incomplete Heart Block.*
"Presse Méd." November 24, 1920.

LAUBRY and Esmein draw attention to sounds heard on auscultation of the heart in a case of incomplete heart block. The case concerned a woman aged sixty-two, who was admitted to the Saint Antoine Hospital complaining of dyspnœa, oppression during efforts of giddiness and buzzing in the ears. On examination, the pulse was regular and slow—thirty-seven to forty-two per minute—the systolic blood-pressure raised; the heart enlarged (orthodiagraphy revealing enlargement of both ventricles). A Wassermann test was negative. On auscultation the heart sounds were dull, the first sound being followed by a systolic murmur propagated to the axilla, the second sound being accentuated at the base. This second sound was constantly followed by a distinct third sound occurring in early diastole, perceptible over the entire præcordium, but particularly clear at the middle portion of the sternum. The pulse was unaltered during the patient's stay in hospital, was unchanged by effort, gave a negative atropine test and a slightly modified amyl nitrite test. But the third sound was invariably present and unmistakable.

Polygraphic tracings taken on many occasions showed a distinct wave occurring two-fifths of a second approximately after the "v" wave, its summit being equidistant from preceding and following "a" waves. It was obviously an auricular phenomenon. The heart block was a two to one rhythm.

Having considered the differential diagnosis between the sound heard by them and similar sounds (extra systole; the third sound of the heart; a *bruit de galop*), and established their claim that it was produced by auricular contraction, the authors point out that this is the first case reported in so far as incomplete heart block is concerned, excluding the mere mention of the condition by Davenport Windle. Incomplete heart block, on the other hand, adventitious sounds have been reported *systoles en écho*, but though accepted by many observers are still discredited by some.

The sound described is produced according to the writers in the same way as the *bruit de galop*—namely, as a result of an energetic

auricular contraction sending its blood into a hypotonic exhausted muscle which reacts by producing a sound heard over the entire præcordial region. Its prognostic significance is similar; thus, it points to exhaustion of the ventricular muscle.

L. ABRAHAMSON.

CRAMER and SCHIFF. *The Osteomalacia of Famine*. "Revue Méd. de la Suisse Normande." November, 1920.

THESE authors report a case of osteomalacia occurring in a woman who returned to Switzerland after having passed through two years of famine in Russia. They summarise the views on the subject of German and Austrian physicians who had abundant opportunity during the war of studying it.

Clinically there is a prodromal period characterised by rheumatic-like pains. The symptoms of the established disease are pain on pressure of the thorax, of the long bones or of the spine; softening of the bones, particularly of the sternum, lower ribs and spine; shortening of the stature; characteristic short-stepping gait or complete inability to get about; deformations, particularly kyphosis, and fractures. The syndrome differs from ordinary osteomalacia in its epidemic character; in its distribution and increase during the war. Clinically we have a more rapid evolution; the whole skeleton is affected uniformly; the pelvis is not affected to such an extent. Therapeutically, osteomalacia of this kind may be cured by increased diet, and by administration of phosphorus and chalk—not so true osteomalacia.

As to the nature of the disease, there are two factors—famine and a disturbance in the ductless glands. To these we may add the antecedent of rickets. In fact there is no essential difference between osteomalacia of famine and late rickets.

L. ABRAHAMSON.

MARTINET: *Aortic Aneurysm—Frequency, Ætiology, Termination*. "Presse Méd." October 16, 1920.

MARTINET summarises twenty-nine cases of aortic aneurysm verified by radioscopic examination. From these he draws the following conclusions:—1. That aortic aneurysms are sufficiently common to be met with by all practitioners. In his statistics, the proportion is four times greater in the male than in the female. 2. The prognosis, though very grave, does not exclude the possibility of a long survival and of considerable activity. 3. Syphilis seems to be by far the main cause, particularly in combination with alcoholism. Anti-specific treatment offers the best prophylactic treatment. 4. The patients die, fifty per cent. by heart failure; the rest suddenly as a result of hæmorrhage or syncope.

L. ABRAHAMSON

M. DURUPT: *The Specificity of the Wassermann Reaction.* Presse Méd." September 11, 1920.

THE author points out that the Wassermann Reaction, when carried out with antigens made from normal organs, is not specific of syphilis. A positive result merely demonstrates a physico-chemical change in the serum which may be caused by other diseases than syphilis, or even by artificial procedure, such as the addition of globulin. He, therefore, argues that two antigens should be used, one made from normal organs and the other from a congenital syphilitic liver. In the case of the latter antigen there will be a sum of two fixation reactions, the first due to the non-specific alteration in the serum, and the second due to the inter-action of the spirochaetes of the liver and the anti-bodies of the patient's serum, i.e., Bordet's phenomenon.

Durupt, for these reasons, uses both antigens. With that made from the congenital syphilitic liver he claims 15 per cent. more positive results in syphilitic cases than with the normal organ antigen. He also states that a positive result is obtained earlier in the disease with the former antigen, and that, at a later stage, a stronger reaction is usually given by it. Where the reactions with the two antigens are the same, if strong the cause is probably syphilis, but if weak some cause, other than syphilis, should be sought.

J. W. B.

GARNIER, M., and REILLY, J.: *Attempted Classification of types of Primary Infective Jaundice.* "La Presse Médicale." November 13, 1920.

LARDONZY, Chauffard, and Kelsh have long established the infective nature of the majority of cases of acute icterus, but the etiology has remained obscure till recent years. Blood cultures were of some assistance, but the discovery of the spirochæta ictero-hæmorrhagica was really the first important step. This organism, however, does not account for all the types. In a series of 1,111 cases collected by the authors only two varieties were frequent, the spirochætal comprising about 30 per cent., and a type which they have called "acute apyretic icterus," constituting about 62 per cent. of the total. The other varieties are much rarer, and include jaundice of typhoid or paratyphoid origin, acute yellow atrophy, and a group of undetermined origin. They also add epidemic and infectious icterus, which they have observed in France, though it is mainly an Oriental disease. They exclude yellow fever from their classification on account of its independent characters, though Noguchi has shown that it is due to leptospira, an organism related to spirochæta. The distinguishing features are:—

(1) Spirochætal jaundice—includes types formerly associated with the names of Mathieu and of Wiel, also most of the cases of severe primary jaundice, especially if associated with renal insufficiency.

It occurs chiefly in occupations involving contact with rats, the latter having been frequently shown to harbour the parasite. This would also explain its occurrence among the troops in the trenches. The attack begins with fever, vomiting and myalgia, but the fever disappears as jaundice develops. After several days, as jaundice disappears, fever returns. The initial rise may be easily overlooked, but is of great diagnostic importance. Jaundice is in proportion to the severity of the attack, but fever is not. Renal symptoms are common, albumen and casts being constant findings, while nitrogen retention and suppression of urine are frequent. Hæmorrhages are not common in the French cases.

(2) Acute apyretic icterus—the common (catarrhal) form of benign icterus, where intense jaundice develops without general phenomena. It begins gradually without myalgia, the temperature remains normal, and the general condition excellent. It lasts from 15 days to five weeks. Spirochætes are not found in the urine. Relapse may occur, or secondary infection of the bile ducts, which might at first sight create confusion with the previous type. The majority of the cases occur in winter, which also serves to distinguish it from the spirochætal variety found chiefly in summer and autumn. Other epidemiological features also point to their being distinct diseases.

(3) The typhoid group comprised only 0.5 per cent., but undoubted cases were observed. The amount of jaundice does not correspond to the temperature, and the cases would be classed as typhoid or paratyphoid fever with jaundice.

(4) Acute yellow atrophy of the liver is characterised by moderate jaundice, prominence of nervous phenomena such as coma, alternating with periods of restlessness, absence of meningeal reaction, diuresis, absence of leucocytosis, frequency of hæmatemesis and melaena and disturbance of coagulation.

(5) Benign cases of unknown origin are sometimes met with. The initial temperature falls less rapidly than in the spirochætal form after the appearance of the jaundice, and does not recur; there is diuresis and frequently no albuminuria, and a rash is often present. Possibly these are mild cases of acute yellow atrophy.

(6) An epidemic and infectious type has been described by numerous authors in various countries. It is a seasonal malady, mostly of summer and autumn, and personal contagion has been observed, which distinguishes it at once from the other species. The symptom-aetiology is remarkably constant. After an incubation period of four to seven days the disease begins with chills, fever, vomiting, epigastric pain, tenderness over the gall bladder, and some enlargement of the liver. Jaundice appears on the third or fourth day and the temperature falls. The course is eight or nine days, and the outlook favourable, though the attack is followed by considerable weakness.

Garnier and Reilly contend that the diagnosis of infective icterus

can be solved on this basis. In a febrile case the spirochætal type will be suspected, and confirmed if the fever subsides and recurs. In an afebrile case deep jaundice without constitutional disturbance suggests the acute apyretic form. Less intense jaundice with slight rise of temperature towards the fifteenth day suggests an attenuated spirochætal form. Finally, very severe cases are more likely to be spirochætal in origin on account of the greater frequency of this condition than acute yellow atrophy.

G. E. N.

WORDLEY, E.: *The Effect of high protein diet on Albuminuria and Blood Urea in Cases of Nephritis.* "Quart. Journ. Med." October, 1920.

THE success of a rich protein diet in certain cases of nephritis with oedema has been ascribed to increase of a low plasma protein. MacLean has shown that in many cases the plasma protein is not increased by this means, and he suggests that the effect is due to increase of blood urea and consequent diuresis. The ability of the kidneys to concentrate urea, as shown by MacLean's test, is exceedingly important in this connection.

Wordley considers it rational to give a rich protein diet in all cases where there is no evidence of retention of urea in the blood. He employs a modification of Van Slyke's method for estimating blood urea, and a gravimetric method for the urinary albumen. In the latter 20 ccs. of urine are used, acidified with 50 per cent. acetic acid, and the protein coagulated in the boiling-water bath for 10 minutes. It is then washed and dried to constant weight. The amount of acetic acid used is of importance, both as regards ease of filtration and obtaining a protein free filtrate, and requires preliminary experiments in each case. The conclusions arrived at are that variations in the amount of protein in the diet do not affect that in the urine; that the protein in the urine shows wide variations at different times of the day, and is lower during sleep; that the blood urea varies considerably with the diet, but that an estimation of blood urea is of much less value than the urea concentration test. In fact the blood urea may be normal with all the manifestations of uremia present.

G. E. N.

PICKERING, D. V.: *Some Observations on the Blood Sugar in Diabetes.* "Quart. Journ. Med." October, 1920.

THESE observations, from Duff House, were undertaken to ascertain to what extent the behaviour of the blood sugar affected prognosis, and how it was related to the age of the patient, the duration of the case, its severity, the carbohydrate tolerance, the amount of oxybutyric acid and its derivatives in the urine, and the complications. Bang's method of estimation was used, but was subsequently found to give a constant error, which altered the absolute, though not the relative, results, and it has now been discarded in favour of

MacLean's. Pickering summarises his conclusions as follows:—

1. The blood sugar is almost invariably raised in diabetes.
2. It tends to increase with the duration of the disease.
3. It varies directly with the clinical severity, but in mild cases with albuminuria or a history of heavy consumption of alcohol or tobacco it is often high.
4. It is reduced by fasting.
5. The reaction of the blood sugar to dietetic treatment is of more importance than its height.
6. A blood sugar persistently above normal in spite of treatment is not invariably a bad sign, but indicates caution.
7. The course of the blood sugar corresponds with the carbohydrate in the food in mild cases, but with the glycosuria in the severe.
8. Carbohydrate taken $1\frac{1}{2}$ -2 hours before the estimation appeared to have no effect on the blood sugar.
9. A high renal threshold (the height of blood sugar concentration at which the kidneys allow sugar to pass through) does not appear to be an unfavourable sign, and the renal threshold shows no striking relation to the age of the patient or the duration of the case.

Brief notes of the fifty cases on which the observations are based are provided in an appendix.

G. E. N.

LAFLEUR, H. A. : *Myelogenous Leukaemia—Treatment by Benzol and X-Ray*. "Can. Med. Ass. Journ." November, 1920.

LAFLEUR reports a remarkable result in a man of 48 who had a large spleen with a leucocyte count of 73,000, including 47 per cent. of myelocytes. A month later, while under treatment, the white cells had risen to 114,000. Benzol m.v., t.i.d., increasing by m.i. every second day, was begun on 30th May, and daily exposures to x-rays till June 20th. On July 31st the leucocytes were 3,000, and benzol was discontinued. During the following winter and spring benzol and x-rays were taken intermittently, and the following June the count was 15,800, with no myelocytes. Lafleur considers that the condition is only in abeyance, but that no other form of treatment can show as beneficial effects. He thinks guarded dosage and frequent blood examinations absolutely essential.

G. E. N.

MAKENZIE WALLIS, R. L. : *The diagnosis of diseases of the Pancreas, with special reference to diastase in the urine*. "Quart. Journ. Med." October, 1920.

As the result of a comprehensive investigation of a large series of cases of pancreatic disease and conditions likely to be confounded therewith, Makenzie Wallis concludes that no one test so far devised can be said to be pathognomonic of pancreatic insufficiency. The association of positive results in three tests, viz., increased diastase in the urine, the Loewi adrenalin mydriasis test, and the presence of glycosuria, is strongly suspicious, and the presence of creatorrhœa

and steatorrhœa confirms the suspicion. The tests are very variable in their results, even in undoubted cases; they may be positive on one occasion and the next negative, and this peculiarity must be borne in mind when judging the results of laboratory investigations. The results in cases of diabetes mellitus were negative, so that they afford no evidence of disturbance of pancreatic function in this disease. He considers of no value in pancreatic diagnosis such tests as the estimation of trypsin and diastase in the faeces, the Sahli test, Schmidt's test, the Cammidge "pancreatic" reaction, and the "Sajodin" test of Winternitz. Full descriptions of the tests employed are given, and also a summary of the cases examined.

G. E. N.

BRAHMACHARI, U. N.: *Treatment of Cerebro-Spinal Meningitis by Spinal Irrigation with Electargol.* "Indian Med. Gazette." September, 1920.

NINE cases of the disease were treated by this method, which consists in the introduction of a dilute (1/10) solution of electargol by lumbar puncture. 15 cc. are injected, and the foot of the bed is raised for 2 to 3 minutes, when the fluid is allowed to run out, and a similar quantity re-introduced. About 100 cc.'s are used at each irrigation, which is repeated every third or fourth day. No untoward results followed except a sharp rigor in two cases. This method of treatment contrasted very favourably in its results with those in more common use, giving a mortality rate of 22 per cent., as against 57 per cent. in cases treated by meningococcus serum.

G. E. N.

ROST, E. R.: *Treatment of Tubercular affections of the enclosed cavities, abscesses and caries by inflation with Oxygen.* "Indian Med. Gazette." September, 1920.

THIS paper is "a preliminary note on a new method of treatment which has given remarkable results." The cases included four of psoas abscess, one of tubercular peritonitis, and three of tubercular joints. When present the abscess was flushed out with eusol or similar solution by means of two cannulae; one was then withdrawn and oxygen admitted directly with the usual precautions, and under sufficient pressure to distend the cavity thoroughly. The oxygen absorbs rather slowly, on the average in about ten days; pain is relieved or stopped; movement is easier, and the temperature falls to normal and remains regular. No after-treatment is required, and early movement can be employed. Only one application was necessary in the joint cases, and free permanent mobility was obtained. The other cases, which were of very severe type, were more troublesome and required several introductions of the gas, but gave even more striking results. The treatment is claimed to be very easy, inexpensive, and most satisfactory.

G. E. N.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

President—A. PARSONS, M.D.

Secretary—G. NESBITT, M.D.

November 5, 1920.

DR. F. C. PURSER and MR. PRINGLE showed an ex-soldier who had sustained a severe gunshot wound of the right thigh in 1918, with complete division of the sciatic nerve. Operation was undertaken 18 months ago, when scar tissue was removed and the divided nerve sutured. Considerable recovery of sensation and some recovery of power had resulted, and were still in progress. A favourable sign was that squeezing the nerve over the head of the fibula caused a radiating sensation down to the toes.

MR. STEVENSON advocated a trial of radium, which he found often hastened recovery in similar cases.

MR. HENRY referred to the protection of the nerve after suture, and thought whatever method had been adopted in this case was eminently satisfactory.

SIR W. I. WHEELER thought the results of nerve suture were generally good, and that recovery of function was possible after very long intervals provided the neurilemma was united. Particular nerves varied enormously in their power of recovery. Attempts to protect the nerve were a failure, and generally resulted in the formation of more scar tissue. All kinds of fancy work such as nerve grafts, anastomosis, etc., had also proved a failure.

DR. PURSER in reply thought there was no objection to a trial of radium, which might hasten a very slow type of case. The condition of the limb as regards warmth made a great difference in the response to tests, which should, therefore, be undertaken under the same conditions for purpose of comparison. He agreed as to the differences in power of recovery in various nerves—he considered the musculo-spiral the most satisfactory, and the median the least.

DR. DOROTHY K. MILNE HENRY showed a case of Mongolism in a female infant aged 7 months. Its size and its cry were those of a normal infant of 7 weeks. It could not support its head, which was round, small, and asymmetrical. The hands reached to the groin instead of to the mid third of the thigh. They were practically

normal as yet, but appeared incapable of grasp; possibly this was due to visual defect or to imbecility. The muscles were hypotonic, and the joints abnormally mobile. The nose was very flat, and this might explain the typical epicanthic folds, for the nasal flattening allowed an excess of skin to droop over the inner canthus. The nostrils were triangular, and the convolutions of the ears showed great simplicity. The tongue in this case was not protuberant nor as yet fissured, but the child had already the habit of tongue-sucking. The Mongolian condition was accompanied by internal strabismus and by unilateral talipes equino-varus. The heart was normal.

DR. MILNE HENRY suggested treating the child with the anterior pituitary lobe extract successfully used by Dr. T. P. Magnier in other cases of delayed development in older children.

DR. CRAIG thought there was no doubt that the case exhibited was of Mongol type, and showed no evidence of cretinism. He emphasised the thin ears and lips, the characteristic throaty cry, the happy, contented aspect, and the peculiar fingers with shortened second phalanx, as diagnostic points. The increased flexibility of the joints was due to hypotonia of muscles. He had tried thyroid extract with negative results, but had no experience of the use of pituitary extract in these cases.

DR. DAWSON said these cases constituted about 4 per cent. of imbeciles. He had rarely seen one so early, but he feared the mental prospects were not good. The back of the head was more prominent than usual, but the forehead was typically flattened. Syphilis did not play an important part, though a number of cases had occurred where signs of the disease were present. The aetiology was, however, quite obscure. The Mongolian was undoubtedly of a very happy disposition, and often surprisingly good at music and mimicry. The cretins were not, however, so unhappy as they appeared.

DR. ELLA WEBB said it was stated that these cases were apt to occur among the later members of a large family. She had two cases under observation, one of which had died, while the other was improving at the age of four, though it also suffered from rickets.

DR. KIRKPATRICK drew attention to the absence of the "blue sacral patch" so often described.

The PRESIDENT (DR. A. R. PARSONS) read his Address on Splenomegalic Hæmolytic Icterus.

DR. W. G. SMITH said that stress had been rightly laid on the occurrence of increased hæmolysis in these cases. It was a normal process, but one about which very little was known. The questions which particularly needed solution were, first, the nature of the process; second, the part played by chemical or biological toxins; and third, the relationship of the bile pigments. The absence of bile from the urine was a remarkable feature, and he thought the bile pigments were probably held back by union with collicids.

DR. NESBITT said that a case under his care, which had proved fatal a few days after splenectomy, showed marked changes in the liver of a peculiar cirrhotic type. The aldehyde test was always strongly positive, and it was accordingly anticipated that the liver would be found diseased. In such a case he thought operation hazardous. This case was of the acquired, not the familial type.

DR. MOORHEAD mentioned a case in which the aldehyde reaction had been negative.

DR. ABRAHAMSON said he had had an opportunity recently of studying the views on the subject of the French schools. He came to realise that definite as was the clinical syndrome, the pathogenesis of the condition was far from settled.

Clinically the condition comprised pale yellow jaundice, anæmia, acholuria with urobilinuria (coloured faeces), splenomegaly. There was no pruritus nor bradycardia. The blood showed a fragility of the red blood cells; a large number of the "granular cells" described by Chauffard and Fiessinger; autoagglutination of the R.B.C.; diminution in size thereof. At times, when fragility was absent, the serum could be shown to contain a hæmolyisin.

Hæmolytic icterus was divided into congenital and acquired forms. In the former the disease was hereditary and familial, not so in the latter. Jaundice predominated in one, anæmia in the other. In the former splenomegaly was much more marked as was also the fragility of the red blood cells and the number of granular cells. In the congenital form there was a diminution, in the acquired an increase in size of the red cells. In congenital hæmolytic icterus the general condition was good; in the acquired form it approached more or less that of pernicious anæmia. In the acquired type the cause might be vague or definite (following an infection, intoxication, or during a cirrhosis). In this case it was termed "secondary acquired hæmolytic icterus."

The first point that needed clearing up was the acholuria. By estimating the bilirubin content in the serum the Gilbert school came to the conclusion that whenever the amount of pigment in the serum was less than 1-3000, no bile pigment appeared in the urine. This was the case in hæmolytic icterus, as also in mild degrees of obstructive jaundice.

As to the pathogenesis, one school attributed the prime factor to the fragility of the red blood corpuscles, as estimated by varying strengths of saline. The school of Gilbert, on the other hand, attributed the main rôle to the spleen. In proof of this they claimed that splenectomy brought about a cure. Again there was a variance with regard to the actual site of bile formation in these cases. The experiments of Whipple and Hocper pointed to the possibility of bile being formed in the general circulation. Others considered that the pigment was formed solely in the liver. A homely example

of the formation of bile pigment without the agency of the liver was afforded by the ordinary bruise with its colour variations.

It had been stated that only in hæmolytic jaundice was fragility of the red blood cells met with. Some work had been done which would seem to point to this as a factor in another disease, viz., bronzed diabetes.

SURGICAL SECTION.

President—E. H. TAYLOR, F.R.C.S.I.

Secretary—A. K. HENRY, F.R.C.S.I.

November 26, 1920.

In the absence of the President, MR. EDWARD TAYLOR, the Address which was to have been given by SIR WILLIAM WHEELER, was, by his own desire, taken as read owing to the shortness of time available under the new curfew regulations. (See p. 1 of this number.)

MR. R. ATKINSON STONEY read a paper on Modern Surgery of the Elbow, and showed three cases of excision of the elbow operated on from 10 months to 10 weeks previously for ankylosis following gunshot wound. A fourth case was shown of operation for flail elbow, the result of gunshot wound. In all cases the result was an arm with good movement of the elbow and fair stability. Owing to the short interval which had elapsed since some of the operations further considerable improvement might confidently be expected. In all cases the patient was satisfied and greatly pleased with his condition.

As the result of the great war the surgery of the elbow had retrogressed by 40 years. Before the war an ankylosed elbow was a surgical failure, and was relieved by excision. Now an ankylosed elbow was looked upon as a success, and excision for it was banned. This change of surgical teaching was largely caused by the bad results obtained by excision of the elbow in the early stages of the war, and this again was the result of the employment of the operation in unsuitable cases and by unsuitable men, *i.e.*, primary excision, which was probably never justifiable, except as a life-saving or arm-saving device, by those who had no experience of this operation in particular, or indeed of surgery at all.

The teaching was now becoming crystallised, that excision was unsuitable in the elbow for gunshot wounds, and that the ideal result was an ankylosed joint. It would appear that this was largely due to the application of the trade union principle of reducing the standard to the meanest capacity, and of want of individualisation, an attempt to make rules to fit all cases.

A good elbow with free movement and moderate stability, was

possible of attainment in most cases of ankylosed joint and in some cases of flail elbow. A moveable elbow was the ideal, not an ankylosed elbow, as some would have us believe. Therefore each case of ankylosed or flail elbow should be carefully considered with regard to (1) his present condition, and the handicap it caused to his work; (2) the result that might be expected from operation, especially with regard to the relative movement and stability of the new joint; (3) the consequent increase in the man's capacity or usefulness at his own job or some new occupation. The position should then be fairly explained to the patient, and he should be allowed to decide for or against operation.

The main points in excision were vertical division of triceps and its insertion into the periosteum and deep fascia of the forearm; limited removal of bone in the forearm; careful suture of the wound in layers; drainage; early electrical treatment and massage. The main points in operations for flail elbow were division of tissues between bones in a vertical direction from behind until the fibres of the brachialis anticus were reached; adjustment of bone ends which should be united, preferably by several strands of silk worm gut; suture in layers of the tissues behind the bones; no drainage; avoidance of early weight or strain on the arm.

SIR WILLIAM WHEELER said that while individual cases should be treated on their merits, it was his general practice to mobilise ankylosed elbows in officers and to secure fixation at an open angle in men, especially in the left elbow-joint. A certain degree of lateral mobility was inevitable after resection, and as a rule the security of a fixed joint was better for manual work.

MR. DOOLIN referred to the dangers of lighting up a latent infection in wounded joints, particularly that of tetanus. He had been accustomed to use the Kocher incision instead of the vertical.

MR. H. STOKES spoke in favour of fixation. He described the original desperate condition of one of Mr. Stoney's patients whom he had seen in France with streptococcal septicaemia.

MR. ADAMS A. McCONNELL thought that the interests of the patient should be consulted in every case, and that the question of fixation or mobilisation should be decided by the employment which he wished to follow.

MR. STONEY in reply said that no rule could be framed for treating lesions of the elbow. Each case should be given the opportunity of the treatment best suited to its requirements. He had never had a case of gunshot injury where tetanus had been lighted up by operation. He used a dilute B.I.P.P. in these cases as a prophylactic against latent sepsis. He preferred a vertical incision, which preserved the fascial insertion of the triceps muscle in the forearm.

SECTION OF
OBSTETRICS AND GYNÆCOLOGY.

President—DR. E. HASTINGS TWEEDY, F.R.C.P.I.

Secretary—D. MADILL, M.B.

December 10th, 1920.

DR. BETHEL SOLOMONS read a paper on Herpes as a type of Vicarious Menstruation. (This paper will appear in the February number of the JOURNAL).

DR. SPENCER SHEILL did not believe in vicarious menstruation. He looked upon herpes as a common accompaniment of menstruation, just as headaches, swellings, etc., were. These symptoms were merely manifestations of vaso-motor disturbance, due to internal ovarian secretion. Where periodical hæmorrhages occurred, *e.g.*, epistaxis, local causes had invariably been found which, when treated, removed the so-called vicarious menstruation.

DR. DAVID MADILL asked if any form of pluriglandular extract had been tried in this case.

MR. A. K. HENRY said that menstruation involved notable vaso-motor changes, and these were controlled by the autonomic nervous system, a system which, taken as a whole, was concerned with wide-spread reactions. Dermographism, for example, was described as being specially pronounced in certain individuals during menstruation, and it was possible to account for this, and for catamenial herpetic eruptions, by a diffusion of exaggerated vaso-dilator response; or, as in Dr. Solomons' case, by a complete shunting of vaso-motor effects into extra-genital channels. In dermographism, urticaria was simulated; while in herpes, the results of vaso-motor activity proceeded to the formation of vesicles.

DR. R. A. MACLAVERTY gave an account of some observations made during a recent American tour.

OBITUARY.

BOOMER, JOHN McWATTERS. Died December 14, 1920. Educated at Queen's College, Belfast; Dublin and Edinburgh; L.R.C.P. & S., Edinb., 1873; late Government Medical Officer, Jamaica; H.M. Surgeon-Capt., Zulu War; late Surgeon New Chile, Potosi and Eureka Gold Mining Companies, Venezuela. Died at Lisburn, Co. Antrim.

DELMEGE, JOHN RICHARD. Died November 17, 1920. Educated at Trinity College, Dublin; B.A., 1891; B.Ch., B.A.O., M.B., 1898; M.D., 1898, Dub.; Medical Officer Federated Malay States Medical Service. Died of cerebral malaria.

KIERNAN, PATRICK JOSEPH. Died December 8, 1920. Educated at the Catholic University School, Dublin; L.R.C.P.I., 1884; L.R.C.S.I., 1884; Medical Officer of Health for Malahide District, Balrothery Union, Co. Dublin.

MADDERS, GEORGE. Died December 4, 1920. Educated at the Carmichael College, Dublin; L.A.H., Dublin, 1885; L.M., Rotunda, 1881.

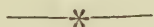
WHITE, KYRAN HUTCHINSON. Died November 30, 1920. Educated at Queen's College, Cork; B.A., R.U.I.; L.R.C.P., L.R.C.S., Edinb.; L.R.F.P.S., Glasgow, 1897; L.M.R.C.P.I., 1898; late Medical Officer Kilsheelan Dispensary, Clonmel, Co. Tipperary.

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ORIGINAL COMMUNICATIONS.



MEDICAL REFORM IN IRELAND.¹

BY ROBERT J. ROWLETTE.

THE present may seem an inopportune time for us to discuss plans for the future welfare of our country in matters of health. At no time for centuries was the outlook so confused, at no period could one with less probability forecast what a few years might produce. It would not be proper to discuss in this place the causes or the cures of the present political disease, but as practical men we must recognise its existence, since it has a vital bearing on the possibility of carrying any reform into effect.

Nearly a year ago, speaking to this Section, I referred to the hopes, which I then shared, that the Irish Public Health Council would succeed in framing a scheme of medical reform for Ireland, radical, far-reaching, and statesmanlike. I think, as I will presently give reason to show, that the Council succeeded in framing such a scheme, not perfect, no doubt, but capable of altering for good the health

¹ An Address, opening a Discussion on the above subject, delivered to the Section of State Medicine, January 14, 1921.

of the country, and of creating a public medical service, progressive and happy. But what has become of this Report? It has been well received by the press and by our profession. It has met little adverse criticism from those interested. But the Chief Secretary has declared that at a moment of transition, when the power of legislation on such subjects is being transferred from Westminster to Ireland, it would be impossible for the British Government to legislate for Ireland in regard to health. It is true that this impossibility did not apply to the subsequent attempt to impose on this country the ill-fated "Ministry of Health (Miscellaneous Provisions) Bill," a measure framed for England and arising out of English conditions, with a few illconsidered snippets of reform for Ireland superadded. The House of Lords, in a mood which augurs ill for progressive legislation in Great Britain, incontinently rejected the measure, and incidentally and unintentionally saved us a further ignominy. At the same interview in which for the cause stated the Chief Secretary declared his inability to act on the Report, he expressed approval of its financial proposals, and declared that on the question of finance no difficulty would have arisen, that the Government was willing to spend any money needed on Ireland! A few days ago, he has again informed the Council of his refusal, but has based his refusal entirely on financial grounds.

But the truth lies deeper than was admitted—or perhaps comprehended—by the Chief Secretary. Without a cordial co-operation between the central and the local authorities, no scheme of medical reform, however admirable, could be brought into being. At the present moment there is no possibility of such co-operation. He would be a fool or a prophet who would venture to predict when or how such a spirit as is necessary will spring into life.

Whether it comes soon or late, one can hardly doubt, however, that some time there will arise in this country a Government with which the people of the country will be ready to co-operate. There is an old Spanish proverb, beloved of that great practical philosopher, Sancho Panza: "When they bring thee a heifer, be ready with the halter."

We ought, by using some foresight, to be able to take some share, not only in providing the halter, but in directing the breeding and nurture of the heifer, even if her milk is reserved for our sons or grandsons.

It is in this hope that I ask you to consider what measures will be best fitted to the needs of our country. If the public good is attained we may be satisfied that our profession will have its proper place in directing and carrying out the health work of the country.

We may, in the first place, consider some of the more important concrete proposals made by the Irish Public Health Council. It proposes, in the first place:—

The co-ordination of the system of central control of the medical and public health services in Ireland by the establishment of a Ministry of Health for Ireland to which should be transferred:—

- (a) All the powers and duties of the Local Government Board for Ireland.
- (b) All the powers and duties of the Irish Insurance Commission.
- (c) All the powers and duties of the Registrar-General of Births, Deaths, and Marriages in Ireland.
- (d) The powers and duties (with certain exceptions) of the Inspectors of Lunatic Asylums in Ireland.
- (e) Certain powers and duties now exercised by the Chief Secretary for Ireland and other Government Departments in relation to health.

The formation within the Ministry of a Health Council, composed of representatives of public and professional interests, to which will be entrusted the general direction of policy in regard to the administration of the medical and health services in Ireland.

The proposed Council is, in my opinion, a point of first-rate importance. It is, I think, the introduction of a new principle in administration—control by an elective body representative of those classes of the community most concerned. The powers proposed for it are extensive:—

The general policy and principles of administration of the public health and medical services, and of all activities of the Ministry directly concerning health under either of the systems indicated above, should be subject to the general control and direction of a Health Council comprising representatives of the local health authorities, of the medical and allied professions, and of other organisations concerned with medical and health services. The

Commissioner in charge of the Medical Department should be Chairman of the Council.

Questions relating to the general system of appointment, promotion etc., of the officers in the medical and public health service, and all matters of principle in regard to the medical treatment of insured and poor persons should be referred to the Council.

Questions involving new legislation upon medical and health matters, and also questions relating to research should come before the Council.

It is particularly to be noted that it is in no sense an advisory body, with or without power of initiation, but a body empowered with direct control of policy.

The proposed constitution of the Council is as follows:—

Six Representatives of Local Health Boards.

Four Representatives of the Medical Profession.

One Representative of the Dental Profession.

One Representative of Veterinary Surgeons.

One Representative of Nurses; and

Two Representatives of Approved Societies.

The Commissioner in charge of the Medical Department of the Ministry should be permanent Chairman of the Council, and should have the right to give a casting vote in case of equality of voting.

The next recommendation is:—

The unification of the existing systems of local administration of medical and public health services by the establishment in each County and County Borough of Health Boards, which would be responsible for the local administration of:—

- (1) The public hospitals, sanatoria, asylums, etc., in their respective areas of control.
- (2) The system of medical treatment of insured persons and of those who are unable to pay.
- (3) Schemes for the medical treatment of expectant and nursing mothers, and of young children, and for the inspection and medical treatment of school children.
- (4) Schemes for the treatment of tuberculosis and other special diseases.
- (5) The general public health system in their respective areas (with the exception of certain local services in urban areas).

A great advantage of enlarging the local unit of administration is that, by dealing with a wider rating area, a less parochial standard of expenditure is established.

Next—

The transformation and development of the present dispensary medical system into a system freed from association with Poor Law administration, and under which insured persons, on a contributory basis, as well as persons who are unable to pay, will be entitled to medical, hospital, and specialist treatment.

The establishment of an Irish Medical Service, appointed (by competitive examination) and paid by the Ministry, from which will be provided the Medical and Veterinary Officers of Health, the medical and surgical staffs of the various public hospitals, sanatoria, asylums, etc., as well as the medical officers engaged in the treatment of the insured and of poor persons.

The establishment of a unified national medical service has long been the dream of medical reformers in this country. Sprung originally, I believe, from the brain of Dr. R. J. Kinkead, of Galway, the project has received the support of every organisation in the past twenty years or more which has considered the matter. By centralising and unifying the system, medical officers would be freed of those degrading conditions of election and service which for seventy years have had a deterrent influence on the most ambitious and able of our young medical men. It is a pathetic thing that seldom have medical teachers in our schools been able to advise the more promising of our pupils to seek a living in the land of their birth. I am not to be taken as saying that the public medical service of this country has not always contained men of the highest professional skill and personal character; but they have been in the service in spite of its conditions, and have struggled in a servitude which broke the strength and the spirit of hundreds. Their services to the poorest of their countrymen may well claim a place in public gratitude beside those of the clergy and the hedge schoolmasters in penal days. But it is true, nevertheless, that the ablest of our young men sought a living outside their native land. Emigration of brains is a more dangerous drain on a country than emigration of muscle. Our land requires the service of the best brains at her disposal, and it is a sign of grave disease that while our ablest fellow-students are employed attending on the

natives of India and England, the natives of Connaught and Munster must be content with the second best.

The finance of the scheme is of the simplest. It is suggested that, having deducted receipts from Insurance sources, the rest of the expenditure should be met equally by the State and the rates. This principle—the so-called “Hobhouse principle”—is now in force in regard to many local services, and has the great advantage of encouraging both economy and enterprise on the part of local bodies. It already governs grants for services regarding tuberculosis in this country, and is supposed to govern the grants for the dispensary medical service. Unfortunately for Ireland, however, Parliament, in 1902, by an ingenious trick, fixed the subsidy from the State at the sum paid in a “standard year.” That sum has remained stationary, while expenditure has necessarily progressively increased.

The Council also recommends that the Ministry of Health for Ireland should have the general control and direction of State-aided medical research work for Ireland. At present, any funds expended on research work in the Three Kingdoms are controlled by a body, meeting in London, on which Ireland is not represented, and which has no knowledge of the special needs or conditions of this country.

Incidentally, the suggestions of the Council would, if carried out, go far to solve the problem of the voluntary hospitals, a subject on which we had a serious discussion in this Section nearly a year ago. Grave as was the problem then, it is even more pressing now. We had hopes that the difficulties which threatened certain of the Dublin hospitals might be—at any rate for a time—shoved out of view by the proceeds of the appeal which was then being made on their behalf. In spite of the energy and exertions of one of our speakers on that occasion—Sir Henry McLaughlin—and his assistants, the results of the appeal can hardly do more than liquidate the additional debts incurred since this time last year. The grant from the Prince of Wales’ Fund, soon to be distributed, may provide enough sand for us to bury our heads in for another few months, but that is all. Our hospitals are not merely

insecure, but are in speedy danger of closing their doors. Their expenditure cannot diminish, and, if they are to be efficient, it must increase. Their income shows no sign of approaching even the present expenditure. A new factor must be brought in, and I see no outlook unless either the State or the local authority comes to their aid. The Report of the Council, if carried out, would have provided for this in the simplest way. It proposed to provide medical attendance, at home or in hospital, as the needs of the case demanded, for three classes—the poor who are unable to contribute anything for such a purpose, the insured, and, on a system of voluntary insurance, those of similar financial and social status to the insured. Under this scheme an agreed sum would be paid for patients sent to the hospitals by medical officers of the Irish medical service as is done at present for certain classes of patients. Most patients seeking hospital treatment other than those thus provided for would have been able to pay for their own maintenance. Such a plan has the great advantage of linking the voluntary hospitals with the medical service of the country, and of making them freely available for those who require them, without interfering with their independence or voluntary character.

Such are the main points of the scheme put forward by the Irish Public Health Council. The Government has declined to act on it, but I am not without hope that, even if not adopted in its entirety—and altering conditions will necessitate modifications—yet that it may at some time form a basis for legislative action.

It is for this reason, as the only concrete scheme before the country, that I have discussed this Report at some length, but there is reason to believe, and to welcome the fact, that the majority of the Parliamentary representatives of Ireland appear to be giving serious thought to matters concerning the health of the country, although no settled scheme has, as far as I know, been made public. In many counties the local authorities, acting under the advice of Dáil Eireann, are taking steps to amalgamate the unions, therein accepting one of the principles of the Report of the

Health Council. They are being urged to abolish work-houses as such, to employ some of the buildings as epileptic colonies, some as sanatoria, some as hospitals, and to board out children. These are evidences of serious consideration. In the difficult days that lie before the country, some gleam of light is thrown on the gloom by the knowledge that on a matter of health sound views are held by those who at present represent popular opinion on political matters.

EXISTING HINDRANCES TO PUBLIC HEALTH WORK IN IRELAND.¹

BY SIR JOHN WILLIAM MOORE,

M.D., D.P.H., President of the Royal Academy of Medicine
in Ireland.

AT the beginning of the third decade of the twentieth century the prospects of Preventive Medicine as a practical policy for Ireland are far from rosy.

In the first place the good ship carrying the Report of the Irish Public Health Council on the Public Health and Medical Services in Ireland, drawn up after a year of patient inquiry and deliberation and presented to Parliament by command of His Majesty the King in accordance with a provision in the Ministry of Health Act, 1919, has been caught in the maelstrom caused by the Act for the Better Government of Ireland, 1920, and is like to suffer shipwreck therein. We all remember the fate which befell the recommendations made by the Viceregal Commission on Poor Law Reform in 1906, and we wonder what dust-laden pigeon-hole in a Government office after fifteen years still hides those recommendations from public view. That they are not quite or hopelessly lost is evident from the fact that the Irish Public Health Council gave them careful consideration when deliberating with the view to the submission to Parliament of an Irish Public Health Bill, or—as it might perhaps be more appropriately called—a Ministry of Health Bill for Ireland.

¹ Read to the Section of State Medicine, January 14, 1921

Notification Fees.

Few at this time of day will be found to question the advantage of timely information reaching the Local Sanitary Authority as to the outbreak or presence of an acute infection in a population. So long ago as 1889 the "Infectious Disease (Notification) Act" (52 and 53 Vict., Ch. 72) was placed upon the Statute Book. Section 4 (2) of that Act provides that "The Local Authority . . . shall pay to every Medical Practitioner for each certificate duly sent by him in accordance with this Act a fee of two shillings and sixpence if the case occurs in his private practice."

A year later the "Infectious Disease (Prevention) Act, 1890" (53 and 54 Vict., Ch. 34) passed into law. Section 2 provides that "expressions used in this Act shall, unless the context otherwise requires, have the same meaning as the like expressions used in the Infectious Disease (Notification) Act, 1889; and the provisions of this Act shall apply to the infectious diseases specifically mentioned in that Act, and may be applied to any other infectious disease in the same manner as that Act may be applied to such disease." The provision as to the notification fee was thus endorsed and extended.

Eighteen years later the "Tuberculosis Prevention (Ireland) Act, 1908" (8 Edw. VII., Ch. 56) reached the Statute Book. Of this unsatisfactory measure Section I. (5) provides that "The Sanitary Authority shall pay to every Medical Practitioner for the certificate duly sent by him in relation to a patient in their district a fee of one shilling if the case occurs in an infirmary, public hospital, or workhouse, and a fee of two shillings and sixpence if the case occurs elsewhere, but only one notification fee shall be paid by the Sanitary Authority in respect of the same patient."

Thus far legislation as to fees payable for notification of infectious diseases.

In August, 1914, the great world war broke out. Rather less than two years after the happening of that stupendous event, the "Local Government Emergency Act" (6 and 7 Geo. V., Ch. 12) received the Royal Assent in May, 1916. Section 5 of that measure contained what I venture to call,

in perhaps justifiable irony, the " War Bonus of the Medical Profession." It *reduced* the fee payable for notification from half-a-crown to one shilling in all cases. Can anyone imagine a meaner transaction under the plausible pretext of " War-time Economy?" or a transaction more likely to neutralise the benefits of notification at the very time when that measure of Preventive Medicine was most urgently needed and most imperatively called for?

The provision was stated in the Act to be of a temporary nature and was to cease to operate at the conclusion of the war. The Armistice came two-and-a-half years later on November 11, 1918; but the Section in question is still in force in January, 1921, on the specious pretext that the war is technically not yet over, peace with Turkey not having been signed.

As I looked upon the matter as little short of a public scandal, I asked Sir William Whitla, M.D., member of Parliament for Queen's University, Belfast, to put a question on the subject in the House of Commons. Accordingly on Monday, November 1, 1920, that active medical member of the House of Commons asked the Minister of Health for England and Wales (Dr. C. Addison) whether it was intended that Section 5 of the Local Government Act, 1916 (6 and 7 Geo. V., Ch. 12, Provisions as to Notification of Diseases) was to remain permanently in force, reducing the fee for notification of infectious cases from 2s. 6d. to 1s.; and, if so, whether the Government was aware that the said section was materially interfering with the notification of diseases throughout the United Kingdom, and was consequently exercising or was likely to exercise an unfavourable influence on the public health?

Dr. Addison said the answer to the first part of the question was in the negative. He informed local authorities in December of last year (1919) that the section referred to would lapse on the date of the termination of the war as fixed by Order in Council, and that after that date the fee to be paid for the notification of a case of infectious disease would revert to 2s. 6d. The date in question was the earliest on which the change could be made, in consequence of the

provisions of Section 24 (2) of the Act. In view of the above explanation the second part did not arise.

Writing to me under date November 1, 1920, Sir William Whitla observes:—"The enclosed reply is very satisfactory as far as it goes. When the war terminates, or is said 'to be terminated,' is an unknown date, but I should think it cannot now be long delayed." It may be news to some of my hearers that we are still at war, presumably with Turkey. Meanwhile the Medical Profession is discouraged by a mere technicality in the performance of their duties, compulsory by law, in the matter of Notification of Infectious Diseases.

*The Public Health Services of Ireland and, in particular,
the Sanatorium Treatment of Tuberculosis.*

The political situation in Ireland and the unrest resulting therefrom have had a disastrous effect of late in regard to the Sanatorium Treatment of Tuberculosis and the administration of the Tuberculosis Prevention (Ireland) Act of 1908. This is not the place to discuss politics, nor do I propose to adopt so unseemly a course in the Royal Academy of Medicine in Ireland. But it does seem extraordinary that an *impasse* between the Local Government Board for Ireland and certain "Local Authorities" should be allowed to cause serious risk to the public health of the country by interfering with and interrupting the machinery provided under Statute for dealing with Tuberculosis, that infection so aptly named "The White Plague." At a meeting held on Tuesday, September 21, 1920, the Irish Public Health Council went carefully into the question of the stoppage of State grants for health services in Ireland. On the afternoon of that day the Council waited upon the Chief Secretary, who is the Minister of Health for Ireland, and represented to him the serious consequences to the health of the community that would be entailed if the Government grants for health services in this country were stopped. The Council laid particular stress on the necessity for continuing the grants for tuberculosis and other special diseases, and also for child welfare.

Prior to the interview with the Minister of Health for Ireland, the following minute, adopted by the Council at the meeting held earlier in the day, was sent to the Chief Secretary:—

“ The Council has learned with regret that there is a danger of grave interference with health work in Ireland by the proposed withholding of certain Government grants earmarked for health purposes. The Council is of opinion that in no case should funds earmarked for health purposes be diverted or withheld; but that services for the care of health should be kept secure apart from all other considerations.”

There can be no question, therefore, that the Council, at all events, did its duty in expressing its deliberate opinion and by informing the Chief Secretary of that opinion.

In a letter to Sir Edward Coey Bigger, Chairman of the Council, dated September 30, 1920, Sir Hamar Greenwood, *inter alia*, expressed his regret that he was not able to give the Council a favourable reply to their suggestion that the grants for Public Health Services should be continued, notwithstanding the refusal of the Public Health Authorities to submit their accounts to audit. He explained—what is common knowledge—that “ the Local Government Board are bound to certify after audit whether the expenditure in respect of which these grants are made has been duly and properly incurred in accordance with statutory rules and regulations, and they would not be empowered to dispense with these conditions even if it were defensible to do so.”

At a largely-attended meeting of medical delegates, representative of the entire Irish Medical Profession, held in the Royal College of Surgeons in Ireland on Wednesday, October 20th, 1920, the action of the Government in withholding the grants for the Public Health Services was considered. The following resolution was unanimously adopted:—

“ Resolved:—That this meeting of the delegates strongly protest against the diversion of the existing grants to the Irish Public Health Services (including portion of the salaries of Poor Law and other Medical Officials) to any other purpose, as inflicting great hardships on the helpless

sick poor, as well as depriving those responsible for their medical treatment of the necessary means to render them efficient professional services."

All this is now "ancient history" in this speed-up age. But the deadlock is not creditable to the Country or to the Government. Something, however, has been achieved to mitigate the threatened evil.

At the sixteenth meeting of the Irish Public Health Council, held on December 14th, 1920, reference was made to the representations submitted by the Council to the Chief Secretary last September regarding the desirability of continuing the State grants for Health Services, and to the reply received from the Chief Secretary. The members of the Council were informed by the Chairman that it had been found possible to make arrangements for the continuation of certain of the grants in question, including those for Tuberculosis and Venereal Diseases. So far, so good.

Restriction of Public Expenditure.

The following announcement was made on behalf of His Majesty's Government by the Chancellor of the Exchequer in the House of Commons on Thursday, December 9th, 1920:—

"While recognising that there are many reforms that are in themselves desirable in order to improve conditions in the United Kingdom, the Cabinet, having regard to the exceptionally heavy taxation which is the inevitable consequence of the war, the high cost of material, the trade reaction that has set in, and the emergency measures required to mitigate the hardships of unemployment, consider that to the extent that such reforms involve further burdens upon the Exchequer or the rates, the time is not opportune for initiating them or putting them into operation.

"It is an instruction, therefore, to all spending Departments that, except with fresh Cabinet authority, schemes involving expenditure not yet in operation are to remain in abeyance. This general principle applies to all spending Departments, but exception must be made, as I have already stated, for such temporary measures as are necessary to deal with the special problem of the unemployed."

Will it be believed that the Irish Public Health Council is one of the bodies which has been singled out for "retrenchment and reform?" Be it remembered that the Council is a statutory body, assigned the duty, under the provisions of Section 10 of the Ministry of Health Act, 1919 (9 and 10 Geo. V., Ch. 21), "of giving advice and assistance and making proposals to the Chief Secretary in connection with his powers and duties under this Act."

Sub-section (1) of Section 10 of the Act is all important. It reads thus:—"For the purpose of promoting the health of the people in Ireland and exercising the powers conferred on him by this Act, the Chief Secretary shall be the Minister of Health for Ireland, and it shall be his duty as such Minister to take all such steps as may be desirable to secure the preparation, effective carrying out and co-ordination of measures conducive to health, including measures for the prevention and cure of diseases, the avoidance of fraud in connection with alleged remedies therefor, the treatment of physical and mental defects, the treatment and care of the blind, the initiation and direction of research, the collection, preparation, publication and dissemination of information and statistics relating thereto, and the training of persons for health services"—surely a far-reaching, noble, and supremely urgent national programme!

How has it been dealt with so far? And how does the Government propose to deal with it in the future?

The answer to the first question is that the Irish Public Health Council have after infinite pains and with great care drawn up and presented to Parliament in June, 1920, a Report on the Public Health and Medical Services in Ireland, which represents the practically unanimous and reasoned views of the members of the Council on the existing defects in the Public Health and Medical Services in this country, together with their proposals and recommendations for the reform of those services. The findings and recommendations in that Report have been approved by a meeting of delegates representative of the Medical Profession of all Ireland.

The answer to the second question is that, with a view

to national economy, His Majesty's Government has decided that schemes involving expenditure not yet in operation are to remain in abeyance, and consequently (unless that decision is revoked) it will not be possible for the Chief Secretary to take any action on the Report of the Irish Public Health Council relative to the establishment of a Board or Ministry of Health in Ireland.

And so this is the outcome of a year and a half's hard work on the part of the Irish Public Health Council.

But this is not all. England and Scotland have each already obtained a Ministry of Health which is in full working trim. It is proposed that the creation of a Ministry of Health for Ireland shall be—perchance indefinitely—postponed.

It is to be hoped that a sufficiently strong expression of public opinion will be brought to bear on the Government to prevent such an injustice to Ireland being carried into effect.

In view of this retrenchment policy, I have had the curiosity to inquire what burden the annual cost of the Irish Public Health Council imposes on the Imperial Exchequer. The answer is Four Thousand Pounds sterling (£4,000). The only comment I would make upon this fact is that the sum is negligible when compared with a statement published in the newspapers a short time ago that the battle-cruiser H.M.S. "Repulse" had been refitted and re-commissioned for active service at a cost of £750,600—over three-quarters of a million of money! (*Vide Daily Graphic*, Monday, January 3rd, 1921, page 2.)

This fact needs no further comment, and must serve as my most eloquent peroration.

A CASE OF BUBONIC PLAGUE IN DUBLIN.

BY SIR A. BALL and H. C. DRURY, M.D., F.R.C.P.I.

In the unavoidably absence of Sir A. Ball, his portion of the communication was related by¹ Dr. H. C. Drury, December 3, 1920.¹

SIR ARTHUR BALL was called to Sir Patrick Dun's Hospital late in the evening, to a case brought in by the ambulance,

¹ Section of Medicine, Royal Academy of Medicine in Ireland.

supposed to be one of strangulated hernia. He ordered preparations to be made for operation before he went down. On arrival he found a young woman aged about 25. She seemed very ill, said she became so three days before, which began with intense pain in the right groin, and that she had vomited. Her temperature was 104° . On examination it was found that there was a swelling of a femoral gland about the size of a walnut, but that there was no hernia. The gland was causing great pain and was extremely tender. There was no redness of the surrounding skin. As preparations were all made for operation he determined to remove this gland, and as the constitutional disturbance pointed to a very virulent infection, he had the gland at once sent for examination.

The entire credit for the recognition and isolation of this case is due to Sir Arthur Ball, who, by observing that he was dealing with some infection of a particularly virulent character, had the specimen immediately examined with a view to future treatment.

To Dr. Synge is due great credit for at once recognising it, and having the courage of his conviction to announce such a startling and unexpected diagnosis, so that the patient was immediately isolated and all steps taken to check the spread of the disease.

It was after this that the case came under my care, so that I have only to deal with its clinical course.

Plague has four clinical varieties—(1) The bubonic form, in which bubos appear in any or all of the lymphatic glands. Most commonly they appear in the femoral and inguinal glands. These swell rapidly, with severe pain, and some break down and suppurate if the patient survives a few days. This is the least virulent form—and to it the present case belongs.

(2) The septicæmic, in which there is high fever of septicæmia type with severe constitutional symptoms. The blood swarms with *bacillus pestis*, and death is almost invariable.

(3) The pulmonary or broncho-pneumonic form, which requires no further description. It is said to be invariably

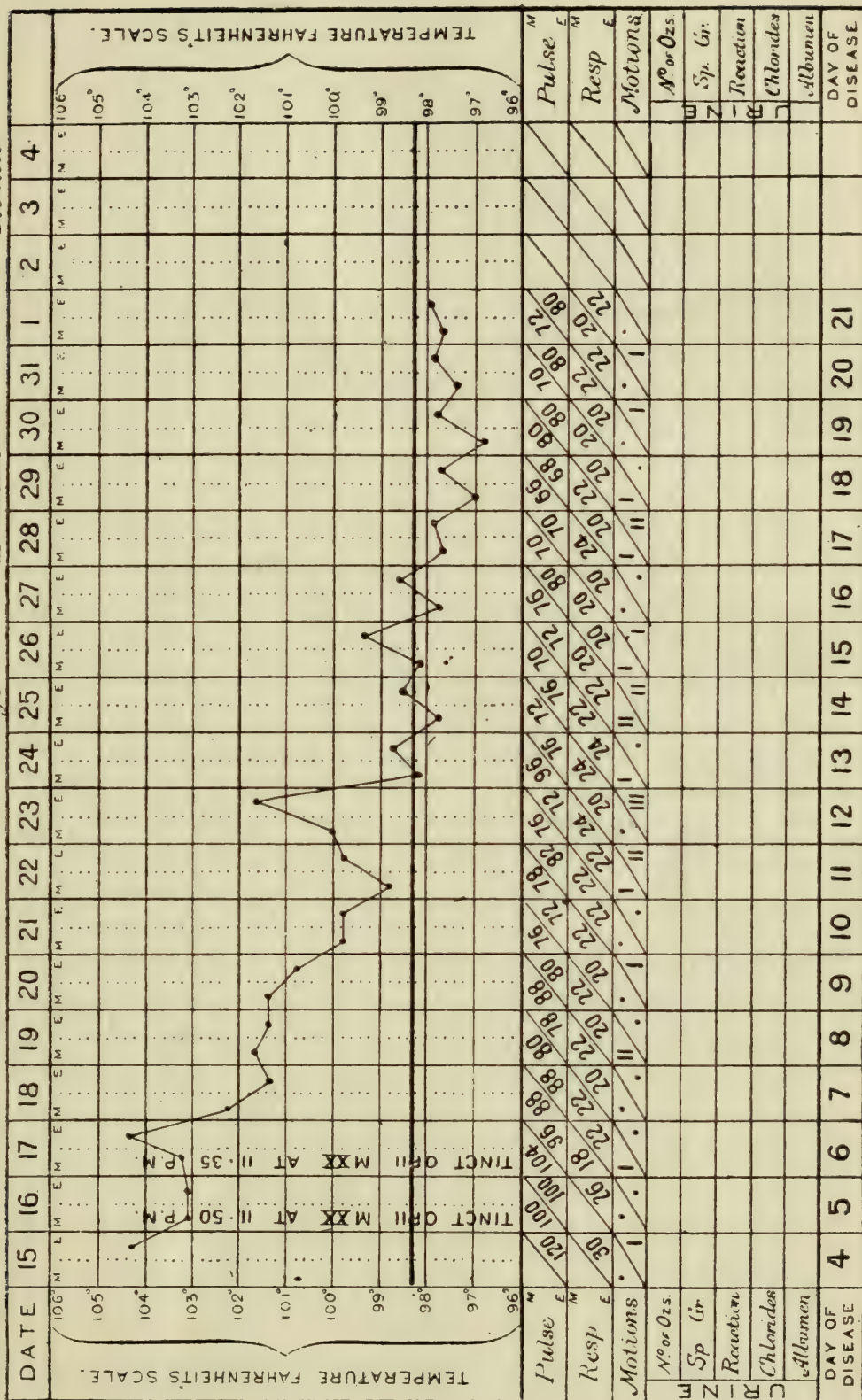
CLINICAL CHART OF TEMPERATURE, &c.
OCT. 1920.

Name

Age

Disease

Result



and rapidly fatal, and also by far the most dangerous to the attendants and others, as the coughing and dyspnœa send a spray of bacillus-laden moisture into the atmosphere, which invariably infects others, unless special and elaborate precautions are taken.

(4) The mixed form—being a combination of any two or the three preceding forms—therefore very fatal.

Its mode of spreading may be by direct infection from one human being to another, either by inoculation with some discharge of the sick through a breach of surface in the healthy, or by inhalation of germ-laden atmosphere. By inoculation through the medium of rat fleas—which have left a sick rat and sought temporary sustenance from a human being. Sometimes the inoculation is caused by the bite of a sick rat or other animal.

The case under consideration was that of a young woman of about 25 years, who came into hospital under the circumstances related by Sir Arthur Ball on the 15th October last. She lived not far from the shipping quays on the South side of the river, in a single room, alone, with a cat as bed-companion. When I saw her first on the morning of the 18th, I was at once struck with her typhus-like aspect. She was heavy, stupid and apathetic, the eyelids drooping, the sclerotics slightly suffused, the face dusky and pallid without a trace of pink colour. The temperature was 102° , pulse quiet, regular and only 100, but very weak; respiration 22. The lungs and heart were healthy, the abdomen normal, save that above the right Poupart's ligament there was a deep swelling parallel to the ligament, about $2\frac{1}{2}$ inches long and about one inch broad. This did not cause pain, but was exquisitely tender to the slightest pressure. The trunk was covered with the marks of flea-bites, and the nurse informed me that she was in a very dirty state on admission. Careful search was made for the minute vesicle or pustule, frequently seen at the site of inoculation on the macule made by a flea-bite, but nothing of the sort was found, and there was no wound to be found on the body.

On the first two nights she was given an opium draught to procure sleep. Small doses (dr. ii.) of whiskey every

third hour and any nourishment she would or could take were given. No serum was administered.

For the first three days in hospital, that is the 4th, 5th and 6th days of disease, the temperature remained very steady between 103° and 104.4° , and probably was much the same for the three days before admission. From the 6th day of disease the temperature steadily fell, reaching 98.8° on the morning of the 11th day. Then it rose again in the evening of that day, reaching almost 102° on the evening of the 12th day, falling next morning (13th day) to 98° , and after that it remained to all intents and purposes normal. This appears to be the usual course of the fever in bubonic cases which recover.

The swelling above Poupart's ligament gradually subsided somewhat. It lost its tenderness almost entirely, when the temperature fell to normal. There was no suppuration, but it remained as a hard indurated flag up to an advanced period of her convalescence. Throughout she had no pulmonary complications whatever, and there were no septicæmic symptoms. Her pulse, at first very weak, remained remarkably quiet all the time, generally under 80, and soon regained strength. Her appetite was quite good, and she was liberally fed. She slept well, soon lost her appearance of sickness and became quite cheerful, doubtless still wondering why she had excited so much interest. The operation wound closed by "first intention" without any appearance of redness or irritation, but in about a week a slight discharge of lymphous fluid appeared; this increased daily, and the wound opened completely, without, however, any signs of inflammation, and the discharge became a thin, watery pus. This continued for quite a fortnight before the wound healed, but it did not delay her convalescence, which was quite good. The discharge was examined at intervals several times, but no plague bacilli were found in it.

SIXTY CASES OF "SUDDEN OR VIOLENT DEATH": AN ANALYSIS.

By M. F. MOLONEY, M.B.

It seems unprogressive that the findings of a Coroner's inquiry should end in the archives of State, inaccessible to the student and in a form which is of little value. Of course one can read reports of inquests in the medical journals, and in the daily Press, and perhaps learn something of interest from them. I submit, however, that such cases thus published have only the characteristics of novelty or morbidity. Again, it is true that Section 28 of the Coroners' Act of 1887 provides that "every Coroner of a borough shall every year make and transmit to a Secretary of State a return in writing in such form and containing such particulars as the Secretary of State from time to time directs, of all cases in which an inquest has been held by him, etc." Are these returns of any value to the investigator of clinical, physical, chemical, bacteriological, or pathological problems? Possibly industrial medicine may benefit from an analysis of these returns. But surely from the thousands of deaths inquired into annually by the County Coroners, concerning which we know nothing except the meagre details furnished in the reports of the Registrar-General, something can be gleaned, which must throw light on the many problems that are yet unsolved "in respect of sudden and violent deaths." The province of a Coroner's inquiry is nowhere better defined than in the form of Oath of Jury, who "diligently inquire and a true presentment make of all such matters and things as are 'given them' touching the death" of the deceased. Inquests without medical evidence are still held, but are extremely few. What a flood of medical knowledge would pour out of the medical evidence had it been accumulated since the duty was regulated and defined by the Statute De Officio Coronatoris 4 Edw. 1 st. 2.

Analysis of Sixty Inquests.

I propose to submit an analysis of the inquests held by me and point out the lessons I have learned from, and the defects I would have remedied in the system as it exists to-day. All deaths inquired into are of a “ sudden or violent nature.” In devising a system of classification for such deaths trouble begins at once if consideration is given to the medico-legal aspect of any case. For the purpose of classification the medical view point must be taken apart from the legal, and vice versâ. The deaths classified in such manner can then be taken and considered individually in the medico-legal aspect. Age, sex, occupation, place, and circumstances of death are factors which belong to both aspects and are, therefore, detailed.

The legal classes are, in the order of importance:—Homicidal, Infanticidal, Suicidal, Accidental, Natural.

All deaths being considered may possibly eventuate in legal proceedings, no matter in what category they have been placed by the Coroner and Jury. For this reason alone medical evidence should be mature and devoid of the necessity of further elaboration. The medical heading is more difficult to define. Neither a regional nor a physiological basis can satisfy our needs.

The system I have devised may have its defects, but it serves my purpose. There is a great need, however, for the revision of this subject of classification, if only to keep medical jurisprudence in touch with progress in the medical world.

The District.

Population, 25,000 to 30,000, mostly an agricultural community, having only one town of 5,000 population, and four villages all under 1,000. The configuration is important: river and sea enter largely into it—death from drowning is therefore not rare.

The Post-mortem.

Sections 19, 20, 23 of the Coroners’ Act, 1887, which confer power to summon a medical practitioner and direct performance of post-mortem examinations, need revision if only for the sake of lucidity. Medical men, as well as the

TABLE A.

CAUSE OF DEATH.

"LEGAL."

HOMICIDAL	INFANTICIDAL and ? INFANTICIDAL	SUICIDAL	ACCIDENTAL	NATURAL
(2)	(4)	(10)	(26)	(18)
Total No. of Deaths ...				

TABLE B.

CAUSE OF DEATH.

MEDICAL.

DROWNING (12); occupational (3); accidental (2); suicidal (5); unknown (2).

OVERLAYING (2).

STRANGULATION (1).

SUFFOCATION (1).

ASPHYXIA.

Total 16

HOMICIDAL (2).

SUICIDAL (5); cut throat (3); rifle B.W. (1); strychnine Poison (1).

ACCIDENTAL (19); burns and scalds (7); vehicular traffic (8); other accidents (4).

TRAUMA

Total 26

DISEASE

Heart (12); Blood Vessels (2); Lungs (1); Alimentary (2); Marasmus (1.)

Total 18.

TABLE C.
CAUSE OF DEATH.

AGE IN YEARS	SEX	OCCUPATION	PLACE WHERE DEATH OCCURRED	FINDINGS
DISEASE				
Total 18.				
75	m.	old age pensioner	workhouse	“ cardiac failure from natural causes.”
60	m.	farmer	home	“ infectious gastro-enteritis.”
60	m.	handyman	roadside	“ cardiac failure (exposure).”
46	m.	commercial traveller	hotel	“ cardiac failure, enlarged heart. P.M.”
24	m.	agricultural labourer	roadside	“ Hæmoptysis from pulmonary Tuberculosis.”
39	m.	tinsmith	roadside	“ cardiac failure from alcoholism and exposure.”
19	f.	domestic	street	“ enlarged heart and dilatation of stomach. P.M.”
71	m.	farmer	home	“ hæmorrhage from varicose ulcer.”
54	m.	tramp	prison cell	“ dilatation of aorta. P.M.”
46	f.	seamstress	home	“ cardiac failure from fatty heart (dyspnœa).”
84	f.	fishhawker	workhouse	“ cardiac failure from natural causes.”
65	f.	lady of independent means	home	“ cardiac failure from natural causes.”
$\frac{1}{6}$	m.	infant	home	“ marasmus.”
47	m.	barber	street	“ syncope following hæmatemesis due to alcoholism.”
43	m.	agricultural labourer	home	“ cardiac failure following rheumatic disease of heart.”
60	m.	fisherman	quayside	“ cerebral hæmorrhage.”
72	m.	mendicant	roadside	“ cardiac failure from natural causes.”
81	f.	lady of independent means	home	“ cardiac failure from natural causes.”

TABLE C.—*Continued.*

CAUSE OF DEATH.

AGE IN YEARS	SEX	OCCUPATION	PLACE AND CIRCUMSTANCE
4½	m.	illegitimate child	home, no fireguard, no supervision.
5	f.	child .	home, no fireguard, no supervision.
6	f.	child .	home, playing with matches.
4½	f.	child .	home, no fireguard, no supervision.
3½	f.	child .	home, no fireguard, no supervision.
1½	f.	child .	home, scalds by overturning of kettle by sister aged six.
50	m.	tramp	found in farmer's outhouse where fire occurred, burnt beyond recognition.
50	m.	sailor	sea, occupational.
40	m.	sailor	sea, occupational.
40	m.	sailor	sea, occupational, torpedoed ship.
22	m.	divinity student	sea, accidental bathing fatality.
20	f.	governess	sea, accidental bathing fatality.
50	f.	nun .	millstream, suicidal.
68	m.	farmer	sea, suicidal.
38	f.	farmer's daughter	river.
27	m.	road contractor	river.
42	m.	farmer	river.
25	m.	agricultural labourer	river, unknown.
28	m.	farmer's son .	river, unknown.

BURNS AND SCALDS

Total 7

DROWNING

Total 12.

TABLE C.—*Continued.*

CAUSE OF DEATH.

	AGE	SEX	OCCUPATION	PLACE	INFLUENCE
SUICIDAL TRAUMA Total 5.	{				
	CUT THROAT (3)	26	m.	rail porter	home . phthisis.
		45	m.	farmer	hospital alcoholism
		68	m.	fish dealer	home . domestic worry.
	BULLET WOUND (1)	49	m.	coast-guard	home . inability to fill position.
	STRYCHNINE POISONING (1)	57	m.	police pensioner	home . alcohol.
	AGE	SEX	PLACE	CIRCUMSTANCE	FINDING
INFANTICIDE and? INFANTICIDE Total 4	{				
	4 months	f.	home	overlying .	asphyxia. P.M.
	newborn	f.	employer's home	mother unattended at birth (illegitimate)	asphyxia. P.M.
	11 days	f.	employer's home	burial had taken place (illegitimate)	asphyxia. P.M.
	14 days	m.	outhouse	child of tramps, overlaying	asphyxia enlarged thymus. P.M.
HOMICIDE Total 2.	{				
	22 years	m.	fisherman	fired at by policeman	B. W. neck and lung
	40 years	m.	gardener	garden stream	wounds of skull and drowning. P.M.

TABLE C.—*Continued.*

CAUSE OF DEATH.

AGE IN YEARS		SEX	OCCUPATION	VEHICLE	CIRCUMSTANCE	TRAUMA
VEHICULAR TRAFFIC	28	m.	horse trainer	traction engine	collision while in charge of horse.	hæmorrhage into spine.
	43	m.	farmer	horsecart .	fall from cart, runaway horse.	fracture, dislocation of cervical spine. P.M.
	3	m.	child	horsecart .	rolled over by cart while alone in street.	no signs of injury "shock"
	7	m.	child	automobile	struck by auto while playing in street.	"fracture of skull."
	65	m.	farmer	horsecart .	fall from cart, runaway horse.	"fracture of skull."
	4	f.	child	automobile	struck by auto playing in street.	"fracture of skull."
	5	m.	child	horsecart .	rolled over by cart, playing in street.	"rupture of lung."
	61	m.	vanman	van	fall from van	"fracture of skull."
Total 8.						
ACCIDENTAL TRAUMA	82	m.	groom	home	fall from ladder	shock and hæmorrhage from scalp wound.
	20	m.	agricultural labourer.	field	fall from horse	"concussion."
	Total 2.					
EXPOSURE	44	m.	farm labourer	road-side	alcohol	severe weather.
	35	m.	farm labourer	road-side	alcohol	severe weather.
Total 2.						

general public, are averse to the performance of the post-mortem. At least that is my experience in cases where legal proceedings are unlikely to follow. Being a general practitioner I can understand the attitude adopted at times when a sudden death has occurred. The practitioner is the family physician—he has a duty towards the members in their grief. The deceased may have been a personal friend and, at some remote period, a patient of the practitioner. The cause of death is certainly in the category “ natural,” but—which was the diseased organ, and why did it fail? It is easy to build upon a “ clinical history ” given by the over-anxious relatives and attach a label which will satisfy the jury and the public, but thereby medical truth is hidden rather than revealed. On the other hand, one does not gain access to medical truth merely by the performance of a post-mortem. The cases of hypertrophy of the heart and dilatation of the aorta, for example, show nothing more or less than that expressed in the findings. I submit, however, that such cases are more satisfactory where we can point to an abnormal condition of a vital part than these in which surmise masquerades as truth.

The total number of post-mortems—nine—shows that only 15 per cent. of inquests are accompanied by post-mortem examinations. Provision of a proper place for the reception of the dead and the carrying out of post-mortems in each Coroner’s district should be made compulsory on the local authority.

Groups and Individual Cases.

The essential details and findings of each case will be found in Table C. Taking the group of deaths due to disease we find that, out of a total of eighteen, twelve were attributed to heart disease. Age of the subject and a definite history are sufficient indications, in nine out of the twelve, to propound a verdict which satisfies everybody, but reveals nothing. There was a definite history of rheumatic fever in one case, and of dyspnoea in another of the three cases, under sixty years. The other cases had elements of alcoholism and exposure. The “ infective gastro-enteritis,”

“cerebral-hæmorrhage” and “marsamus” are not satisfactory. The case of hæmatemesis was certainly one for a post-mortem, to my mind. But when a brother general practitioner thinks that such would be unwarranted on the grounds of scientific curiosity, what can be done? Since my student days I have wanted to know where the blood comes from in those cases. I have seen illustrated in the literature dilated and ruptured œsophageal veins which are found in similar cases, but here was an opportunity to seek the truth directly.

Another case in which necropsy should have taken place was that of the three year old child said to have been rolled over by cart. In this case “shock” satisfied everybody but the Coroner, and the unfortunate culprit who was returned for trial on a charge of manslaughter. There were no marks whatsoever of external injury. The term “shock” has provided another counterpane for the multitude of sins already covered by “syncope” and “cardiac failure.” I am aware that the power of ordering a post-mortem rests with the Coroner. But when medical men and the public are so chary of the performance the difficulty becomes insurmountable.

There is little else of interest in the other groups. It is, however, appalling to think of the loss of child-life by burns and scalds which occurs everywhere in Ireland each year. Laws exist for the protection of children from fire, but the authorities are unwilling or too busy with political crime to enforce them.

It is strange that vehicular traffic should exact such a toll in a district like mine. The majority of deaths, it will be seen, are those of children and must, therefore, be attributed to lack of discipline and instruction in the schools, perhaps also to the fact that there is no regulation of the traffic.

The suicides, as is their wont, select the readiest means—namely, river and sea. The causes of infanticide were established with ease, although in one case the body had been secretly buried for a week.

The cases of homicide.—The bullet wound case is signifi-

cant of the political condition of the country. A policeman recently arrived from a “ disturbed ” part into a peaceful district blazed away at a civilian who came to the barracks for assistance to quell a drunken brawl indulged in by alien sailors.

The second case had, at the time of investigation, all the attributes of a brutal murder. The medical evidence was elaborate in the extreme, and went, with more haste than discretion, into the details of the crime. The motive and the murderer are yet undiscovered and, while some of us have still our doubts, the Crown, I learn, has taken the view that suicide should have been the verdict. I am willing to contend that the inquest without a post-mortem is a good thing in itself. It acts as a flood-gate for the verbal sewage that flows from the ubiquitous gossip mongers, even in the shadow of death. It is clean and wholesome; it emphasises the importance of human life. But *Tota ars medica est in observationibus* must apply here if anywhere. The speculative physician has no place at this function which seeks a true verdict, “ for the truth,” as we are told by Rousseau, “ is in things and not in our minds, and the less of ourselves we introduce into our judgments the nearer we shall approach to truth.” When Moliere poured pitiless ridicule on the great little men of his time, medicine had fallen on evil days. Investigation had been replaced by philosophical interpretation. The vast majority of our medical witnesses of the present day are guilty of the same pretentious verbiage which called forth the satire of our greatest lay critic at the vain ceremonial of an inquest without a post-mortem investigation of the vital organs.

We must not take to heart, however, the socialistic ravings of the modern Moliere. Shaw demands that we should focus all attention on the well and let the sick walk the plank, and the dead be cremated before any noxious odours arise. Let us turn rather to the less prolix and kindlier Kipling, who, speaking as a patient, points the moral of my discourse:—“ Of course, it is a little unfortunate that Death, as the senior Practitioner, is bound to win in the long run, but we non-combatants, we patients,

console ourselves with the idea that it will be your business to make the best terms you can with Death on our behalf; to see how his attacks can be longest delayed or diverted. And when he insists on driving the attack home, to see that he does it according to the rules of civilised warfare."

While the Registrar-General complains of the large number of uncertified deaths each year in Ireland, nobody comes forward to assign a reason why this laxity should continue. "Of the total deaths registered during 1917, no less than 17,021, of 23.4 per cent., were returned as uncertified—the average for the preceding ten years, 23.3."

Is it not time that our Public Health Council looked into the whole system, which has had no revision since 1883, except with reference to the appointment of deputy Coroner? Salaries are inadequate, and for this reason alone inquests are avoided on the mere assumption that death has been necessarily due to natural causes. The deaths reported to the Coroners by the police are mostly accompanied by the remark: "No suspicion of foul play." The inclusion of the phrase in the police report is sufficient, in many instances, to relieve some gentlemen of the onus of holding an inquest. The abolition of the non-medical Coroner will be of no avail should the present system and its inadequate remuneration be allowed to go unrevised. The setting up of a medico-legal department in each county and county borough having charge of Registration, Vaccination, Sanitation, Cemeteries, Abattoirs, food and drugs and inquests, etc., should lead to efficiency. All cases of sudden or violent death should be investigated by this department, over which a medico-legal chief or a medical man, with a legal assessor, should preside.

A CASE OF CARCINOMA OF THE ANTRUM OF HIGHMORE.

BY FRANCIS T. MORRIS.

THE patient, a female aged 32, was admitted to St. Vincent's Hospital, 5th November, 1920, with a small tumour about the size of a hazel nut projecting above the right canine tooth.

She had several teeth extracted from time to time, those present showed moderate pyorrhea; six weeks previously the first upper molar was extracted. For a week afterwards the jaw was swollen and painful; this condition subsided and the tumour gradually appeared. She never suffered any pain and it was not tender on pressure. She had no epiphora or nasal discharge and no epistaxis.

6th November—The mucous membrane was reflected over the tumour, which was seen to be growing from the interior of the antrum; a piece was removed and sent to Dr. O'Farrell for examination.

The Pathologist's report is appended below.

8th November—With the assistance of Dr. P. J. Keogh I removed the maxilla. Preliminary ligature of the external carotid disclosed no enlarged gland.

The patient left hospital ten days after operation.

The tumour originated at the upper and posterior wall of the antrum. X-Ray examination showed no involvement of bone by the growth, even where the anterior wall is perforated the bony trabeculae were distinct. The growth apparently originated in the mucous membrane of the antrum, but did not show the character of columnar epithelioma.

Report on piece of tumour removed at first operation.

This specimen is about the size of a walnut and is of moderately firm consistency.

Sections cut show the following histological characters:—

The tumour consists of aberrant epithelium collected into masses of varying size and surrounded by fibrous tissue.

The epithelial cells are large and markedly vacuolated.

giving rise to a net-work-like appearance. The nuclei are about one-fifth the size of the cells. Mitotic figures are fairly numerous.

The cells closely resemble squamous epithelium, but no cell-nests could be found.

In many places, particularly where the masses of epithelium are large, the tissue is necrotic.

The whole section is more or less infiltrated with polynuclear leucocytes, these being more numerous in the necrotic areas.

Right upper jaw removed by operation.

The bone is practically intact, except where the tumour has perforated the anterior wall. A considerable amount of tumour substance was found in the nasal fossa, but this part of the new growth has become detached from the specimen; the site of invasion, however, can be seen.

REVIEWS.

1. *American Medical Biographies.* By HOWARD A. KELLY, M.D., LL.D., F.A.C.S., Hon. F.R.C.S. (Edin.), and WALTER L. BURRAGE, A.M., M.D. Baltimore: The Norman Remington Company. 1920. Pp. xix+1320.
- 2 *George Miller Sternberg: A Biography.* By his wife, MARTHA L. STERNBERG. Chicago: American Medical Association. 1920. Pp. ix+331. [Illustrated.]

THESE volumes are two notable contributions to medical biography, and will be read with interest far and wide beyond the confines of the United States of America.

The first, a portly volume of more than thirteen hundred pages, is "dedicated in Love and Esteem to the Memory of Sir William Osler." Its pages contain biographies of over nineteen hundred—to be accurate, 1,948—men who have in any way contributed to the advancement of medicine in the United States or in Canada. The authors have included in that number every man who, being a physician, has become illustrious in some other field of general science or in literature. The book is carried through the year 1918, and represents an enormous amount of labour and research.

The name of General George M. Sternberg is well-known on both sides of the Atlantic. "The story of General Sternberg's life," writes M. W. Ireland, Surgeon-General, U.S. Army, in an appreciating Foreword, "is one of arduous devotion to duty, of unflagging industry, and of unexcelled patriotism."

The book is delightfully written by the General's devoted wife, Martha L. Sternberg, described by General Ireland as a "lady of the Army, about one of the most eminent of our Medical Corps."

A Pocket Medical Dictionary. By GEORGE M. GOULD, A.M., M.D. 8th Edition revised. H. K. Lewis & Co., Ltd., London. 1920.

THIS convenient book, in addition to giving the meaning of 40,000 terms used in medicine and in the allied sciences, contains tables of symbols and abbreviations; of muscles, giving their origins, insertions, nerve supply and function; of nerves and their distribution; weights and measures; and finally, tables of doses used in medicine and in veterinary work.

In this profusion of information we notice several omissions which will doubtless be made good in a subsequent edition. These include:—*Arneth index*, *elephantiasis nostras*, *Jarish-Herxheimer reaction*, *Köhler's disease* (isolated disease of the tarsal scaphoid), *oculo-cardiac reflex*, *Perthe's disease* (osteo-chondritis deformans juvenilis).

We think the value of this useful dictionary would be greatly enhanced if the Greek and Latin derivations of scientific terms were briefly indicated.

The print of this small and comprehensive volume is clear and easily read.

A Manual of Elementary Zoology. By L. A. BORRADAILE, M.A. London: Henry Frowde, Hodder, Stoughton. 1920. Third Edition. Pp. xviii.—616.

THE third edition following the second at an interval of thirteen months, and the only alteration being the addition of fresh illustrations argues well for the popularity and stability of the *Manual*. It is indeed an excellent zoology of the evolutionary kind, and the matter is well selected. The 420 illustrations clearly illustrate the text. The new drawings are entered as plates, so as not to disturb the old arrangements.

The frontispiece shows members of the snow family, as drawn from a case in the Natural History Museum, and even if it shows them in somewhat greater harmony than if they were in the wild, the exigencies of space require it. The other plates give details which further elucidate the figures, and illustrate phosphorescence in deep sea life, and the varieties of sheep through breeding. There are portraits of Lamarck, Darwin and Mendel.

Public Health and Hygiene. Edited by W. H. PARK, M.D. Lea & Febiger, Philadelphia and New York. 1920. Pp. 884.

THIS work consists of a large number of articles written by different authors. Many points which do not as a rule receive much attention in works on Hygiene and Public Health are discussed in detail, for example, the Schick

reaction is very fully dealt with in the article on diphtheria. One is surprised to read that "dried blood is ordinarily used" for the Widal reaction, although the inaccuracy of such a method is admitted. The book is interesting, and contains much valuable information. The style is too diffuse and lacks conciseness, while diagrams are not sufficiently numerous. There are a few misprints—*e.g.*, "serem" (p. 47), "Treponema pallida" (p. 69). V. M. S.

A Consulting Surgeon in the Near East. By A. H. TUBBY, C.B., C.M.G., M.S. (Lond.), F.R.C.S. (Eng.). A Consulting Surgeon to the Mediterranean and Egyptian Expeditionary Forces, 1915-1919; Lieutenant-Colonel R.A.M.C. (T.), and formerly Temporary Colonel A.M.S. London: Christophers, 22 Berners Street, W. 1.

COLONEL TUBBY writes easily and well. He has produced a book which will be read with the greatest interest not only by those who were out in the East during the conduct of the operations of our Armies in Gallipoli and Egypt, but also by the general public. Without going too much into detail, he gives one a clear account of the type of work which, as a Consulting Surgeon, he was called on to perform. He had the great privilege of seeing some of the Gallipoli fighting, and gives an eye-witness's description in a most vivid manner of what he saw. He also describes the medical organisation in Egypt, and is generous in his praise of the work of others. His short sketch of the work done by the late Colonel Sandwith is particularly pleasing. All who had the pleasure of meeting Colonel Sandwith will fully endorse everything that the author says. A short account of work seen and done in Palestine is also included. The work is illustrated by a few good photographs, and is nicely got up.

Manual of Obstetrics. By EDWARD P. DAVIS. Second Edition. W. B. Saunders & Co. 1919. Pp. 477.

DR. DAVIS has added to and revised the text of the original edition. Still there are a few points which might be improved on.

In the rough estimation of the true conjugate, having

determined the oblique conjugate, one is told to "subtract the height of the pubis" and so obtain the true conjugate.

In the treatment of central placenta prævia he says:—"The obstetrician must cautiously dilate the *cervix* to enable him to introduce the hand within the *vagina*, to pass several fingers through the *cervix*." Again in marginal placenta prævia he advocates the dilatation of the *cervix* followed by rupture of the membranes.

Some statements are open to objection; such as:—"Parietal bone presentation is an impossible position for labour." Others might be deleted with advantage, *i.e.*, "It must be remembered that presentation applies to the foetus and not to the mother," and "The presenting part emerges at the bowel."

In further editions a little more might be added with regard to infant feeding.

As a manual of midwifery it is open to the objection that it presupposes some knowledge of the subject, so at present it cannot be recommended fully. J. S. E.

A Synopsis of Surgery. By ERNEST W. HEY GROVES, M.S., F.R.C.S. 5th Edition. John Wright & Sons, Ltd., Bristol, 1920. Pp. vii+620.

A FIFTH edition of this useful synopsis is a tribute to its wide and deserved popularity. It is based, as its author states, on that most comprehensive and clear of all textbooks, "Rose and Carless," and he would probably be the first to regret that his own synopsis should in any way replace that treatise in the hands of students. The book is frankly intended as a methodical summary convenient for revision, and as such it is excellent.

The chapter on fractures has been considerably expanded; new antiseptics, the grouping of blood-donors and methods of blood transfusion are included. All the figures illustrating surface markings have been re-drawn and printed in colours, and the essentials of the subject are clearly epitomised in twenty-seven short pages. The arrangement of type and headings is clear and effective.

ABSTRACTS OF CURRENT LITERATURE.

GYNAECOLOGY.

STEVENS, W. E. and HAPNER, M.: *Gonorrhea of the Lower Genito Urinary Tract in Women (with special reference to the Glands of Bartholin)*. "Journal of American Medical Association." November 20, 1920.

THESE authors base their paper on the results obtained from 3,439 examinations of women who were presumed to be suffering from chronic gonorrhea. The infection was definitely established by test in 43.5 of the cases. The cervix, urethra and one or both glands of Bartholin were the organs affected in 47, 32 and 23 per cent. of the cases respectively.

Smears were obtained from the cervix after thoroughly cleansing the canal and compressing the anterior and posterior lips by means of a bivalve speculum. Apparently, the trauma caused by this procedure contributed to the successful demonstration of the gonococci.

The treatment adopted in endocervicitis, and for which they claimed good results, was the application of 25 per cent. silver nitrate followed by a vaginal douche of 4 gallons of very hot water. Another method was cauterisation of the cervix. In some cases, 2 or 3 applications were necessary. Sixty per cent. of cases were cured by this treatment.

Urethritis.—A careful examination was made for the involvement of Skene's ducts, if these were affected they were destroyed by the actual cautery or fulguration electrode. Where chronic urethritis was present, the application of 1-3 per cent. of silver nitrate through a short female endoscope was found beneficial.

Glands of Bartholin.—These glands were infected in 23 per cent. of the cases examined; the authors recommend, and carry out in their own practice the extirpation of these infected glands. There is one interesting fact in connection with this matter, that in a series of fifty-two instances where these glands were examined, though no gonococci could be demonstrated in the secretion before removal, the organisms were found on 29 occasions in the discharge from the wound.

Conclusions.—1. Gonorrhea, is common in women. 2. Gonorrheal urethritis, is due to glandular involvement. 3. Urethral strictures,

are common and require treatment. 4. Bartholin's glands and ducts, are frequently infected. 5. Urethral glands, must be destroyed, and Bartholin's glands excised. 6. Inability to demonstrate gonococci in Bartholin's glands does not contra-indicate excision.

LOUIS CASSIDY.

LABORDE, S. : *Radium Therapy of Menorrhagia and Metrorrhagia*.
 "Gazette des Hopitaux, No. 109, 28 and 30." December 30, 1920.

THE types of uterine hæmorrhage discussed in this article resolve themselves into two, *e.g.*, 1. Hæmorrhage provoked by a fibromyoma. 2. Hæmorrhage coming from a uterus in which there is no demonstrable anatomical lesion.

Radium has been used in the treatment of both classes. The author states that his best and most rapid results in the fibromyomatous uteri were obtained when the tumors were small and limited to the pelvis. Under the influence of radium, arrest of the hæmorrhage occurred and was followed by the diminution in size of the tumour, he describes these effects as being due to two causes.

1. The almost immediate cessation of the hæmorrhage is due to the direct action of the rays on the uterus and the fibroma. The radium produces an endarteritis obliterans of the arteries which leads to stoppage of the hæmorrhage, and a reduction in volume of the tumour. This latter effect is due, in his opinion, to the action of the rays on the ovaries.

Technique.—He employs vaginal irradiation by means of an apparatus consisting of platinum tubes 1.5 m.m. in thickness. In order to prevent the action of secondary rays, the tubes are enclosed in a sheath of aluminium two hundredths of a millimetre thick, which is surrounded by cork. It is very important to protect the vaginal mucous membrane from the rays. Exposing the parts with a speculum, one of the above tubes is placed in each lateral fornix of the vagina, they are maintained in position by means of a tampon.

The patient's age, not the size of the tumour, determines the dosage. For women near the menopause, 50 milligrams of radium divided between the two tubes, should be left, *in situ*, for 48 hours. Two applications with an interval of six weeks should definitely produce the menopause.

For younger women the treatment should be carried out at a number of sittings which will take place at intervals of six weeks. The dose is 50 milligrams of radium, but the application will only last 24 hours, and their renewal will depend on the results observed.

The treatment of large fibromata is carried out by means of an intrauterine tube passed through the cervical canal after dilatation; the tube is well protected and contains 500 millicuries of radium, it remains *in situ* for 3 hours. This form is combined with radium

applied to the surface of the tumour externally. Contraindications are:
1 Fibroma accompanied by peritonitis, fever, etc. 2. Salpingitis.
3. Extremely large fibromata.

Hæmorrhage.—Cancer being excluded by examination of curetment material, radium treatment is carried out as detailed above.

The methods outlined in this paper are simple, and with care should be devoid of risk, and are certainly worthy of trial in suitable cases.

LOUIS CASSIDY.

JAEGER, H. : *Ultero-gangrenous vaginitis due to mercurial poisoning*.
"Revue Méd." December, 1920.

JAEGER lays stress on the necessity for careful vaginal examination during the course of treatment with mercury. He gives the history of two fatal cases following treatment for secondary syphilis with neo-salvarsan combined with intra-muscular injections of mercury.

In the first case, mercury was given in the form of grey oil; the symptoms of poisoning came on during the course of treatment when she had received 0.30 gr. of pure mercury. In the second, treated with salicylate of mercury, the poisoning was not noticed for several weeks after completion of the course.

(1) In the first case small ulcers were noticed at the vulva which grew larger in spite of local antiseptics till in time the vaginal mucous membrane was completely necrosed, normal serum and blood transfusion were also tried, but her general condition became worse; she developed pelvic peritonitis, and intractable diarrhoea, and died about four weeks after commencement.

(2) In the second case, six weeks after discharge from treatment, the patient noticed some pain in the gums and headache, but was not seen till two weeks later when she had a necrotic gingivitis with hæmorrhage and again two ulcers on the vaginal wall. She died two days later.

The pathological findings in these two cases besides the vaginal condition were:—(1) Diphtheritic enteritis and cystitis, and parenchymatous nephritis, and it was possible to demonstrate the presence of mercury in the vaginal mucous membrane. (2) Parenchymatous nephritis and necrotic stomatitis. J. S. E.

YERSIN : *Intraperitoneal hæmorrhage due to rupture of a small cyst of the ovary*. "Rev. Méd." December, 1920.

YERSIN reports a case he attended. She was aged 30, menstruation normal three days previously, she was pallid, but not collapsed. Temp. 37.5° C. Pulse 75. She complained of violent intermittent attacks of pain in the right iliac fossa which had commenced suddenly two hours previously accompanied by vomiting. There was marked rigidity of the lower abdomen. A provisional diagnosis of appendicitis was made, and the abdomen opened five hours later.

On opening the abdomen there was an escape of free blood, the appendix was normal, one of the ovaries was found to have a ruptured cyst as big as a pea oozing blood, drop by drop. The ovary was resected. As the amount of blood was so great, it was thought that it could not be caused by so small a lesion: other abdominal organs were examined but were found to be normal. The patient had an uneventful recovery.

J. S. E.

DARTIGUES, L.: *Suspension of Uterus by Extra-Peritoneal Ligamentopexy associated with Transverse Supra-Pubic Laparotomy.*
 "La Presse Medicale." November 10th, 1920.

THE operation described and illustrated by nine figures (which cannot unfortunately be reproduced here) is practically an Alexander Adams operation combined with a laparotomy. The author enunciates the principle that the operative ideal is only attained, when in the repair of a lesion the normal anatomy of the parts is restored as far as possible. He claims that he fulfils this condition in his operation.

Technique.—A transverse incision is made across the upper border of the Mons Veneris, this extends down to the aponeurosis. A vertical incision passes through fascia and peritoneum; when the abdomen is opened any condition of the adnexa is suitably dealt with. The lower border of the wound is retracted downwards until the external abdominal ring and round ligament are exposed. The inguinal canal is opened, the round ligament pulled out as far as necessary, the effect on the uterus being observed through the abdominal incision. The ligament when fully stretched is stitched to the cut edges of the inguinal canal which is closed in the ordinary way. A similar procedure is adopted on the other side, and the two free non-excised loops of the round ligaments are united across the middle line.

The results, according to the author, are extremely satisfactory. The combination of a laparotomy with extra peritoneal shortening of the ligaments, enables the operator to assure himself that any pelvic lesion other than the retroflexion can receive attention.

LOUIS CASSIDY.

OTO-RHINO-LARYNGOLOGY.

DUNNING, H. S.: *Surgical Treatment of Chronic Maxillary Sinusitis of Oral Origin.* "Journal of the American Medical Association." 20 November, 1920.

THE author condemns the drainage of the antrum through the alveolus even when a carious tooth has been extracted and the antrum found to be infected. In all cases he advocates drainage through the nose by an opening under the inferior turbinal, polypoid

mucosa and granulations being removed from the antrum at the same time. The alveolar opening should be closed as soon as possible. In the first instance a temporary "saddle plate" is employed to cover the alveolar opening in order to prevent contamination of the antrum from the mouth. Subsequently he closes the opening by means of a pedicled flap of mucous membrane which is separated from the hard palate down to the periosteum. This flap is "shunted" outwards over the alveolar opening and sutured to the gum on the outer surface of the canine fossa after this has been separated from the bone as a labial curtain. Before suturing the palatal flap over the alveolar opening the edges of the opening must be freshened and freed of all soft tissues down to the bone. Dunning claims that this method never fails.

T. O. G.

LOGAN, TURNER, A.: *Carcinoma of the Post-Cricoid Region and Upper End of the Œsophagus*. "Edinburgh Medical Journal."

TURNER first deals with the anatomy of the part, and shows that carcinoma is most frequent at the constricted areas, viz., at the level of the cricoid, at the crossing of the aortic arch, at the bifurcation of the trachea, and the diaphragmatic opening. Squamous celled epithelioma is the most common variety of malignant tumour in the œsophagus, constituting 90 per cent. Logan Turner rightly lays stress on the necessity of early diagnosis before infiltration of the surrounding structures has occurred, *e.g.*, the recurrent laryngeal nerves, the carotid sheath, and the trachea and thyroid gland, and before the lymphatic glands have become involved. Unless early diagnosis is made operative interference will prove abortive. Carcinoma is more frequent in women in the post-cricoid region, whereas in the case of the lower end of the œsophagus men are more often the victims of the disease. The points in diagnosis referred to are:—mode of onset, viz., sudden or gradual obstruction, dysphagia, pain on swallowing, a gurgling noise on deglutition, blood stained expectoration, excess of mucus in the throat, cough and hoarseness, dyspnœa. Physical examination may reveal enlargement of the larynx and trachea and of the cervical glands, and tenderness. The laryngoscope and œsophagoscope will demonstrate the presence of the tumour. The use of the œsophageal bougie is condemned as a diagnostic agent in view of its danger to the patient when blindly introduced. A piece of the tumour should be submitted to microscopic examination.

A bismuth meal followed by x-ray examination will often be of service in locating the growth and the length of the stricture.

The prognosis is bad, as a rule only palliative measures being possible. Œsophagostomy and gastrostomy are the two alternatives in advanced inoperable cases.

The question of excision occasionally may be considered if by

removal of the growth the comfort of the patient is likely to be improved or his expectation of life prolonged. Logan Turner does not wax enthusiastic over the results of excision, his resumé of cases which were considered operable showing, with but two exceptions, very little longer life than the majority of the cases which were treated by palliative measures.

T. O. G.

PORTMANN, G. (Bordeaux): *Fibro-Tuberculoma of the Larynx*.
 "Presse Médicale, No. 11." February 7, 1920.

TUBERCULOSIS not only produces limited neoplastic manifestations but may also cause a large laryngeal tumour which little by little invades the vocal organs and the surrounding tissues. This species of tumour which the writer describes as a fibro tuberculoma, is peculiar as to its histo-pathological structure, but its clinical manifestations are so like those of a neoplasm that they may be mistaken for one.

He makes a complete clinical, anatomo-pathological table.

The functional symptoms are those of all laryngeal tumours; dysphonia and hoarseness at the beginning, then aphonia when the tumour has increased in size and respiratory troubles and attacks of suffocation appear.

An important sign is that the fibro-tuberculoma never produces real pain. Objectively a localised tumour is observed in the different stages of the affection, the seat of which is variable but well marked at first, and spreads little by little to the adjoining tissues. From within the larynx it spreads beyond that organ and progresses towards the exterior.

The fibro-tuberculoma, the evolution of which is nearly always very slow, is composed of the fibrous tissue, in which typical tubercles are found, either alone or agglomerated.

Its diagnosis being difficult in the early stages from syphilitic gunma, and especially from advanced cancer, can only be made with certainty after a biopsy and a histological examination.

The tumour though not dangerous at first on account of its slow development and of the general good health, may become so by the obstacle that it forms to the passage of air.

Justifying an endo-laryngeal intervention in its early stages, the fibro-tuberculoma can thus be cured without danger of a relapse. If the endo-laryngeal operation is no longer possible on account of the extension of the lesions, partial or total laryngectomy must be abstained from and palliative tracheotomy performed.

The writer believes that cases of fibro-tuberculoma, mistaken for cancer and operated upon as such, are more numerous than is supposed. His work is another proof that no intervention should be practised on a larynx without a previous histological examination.

GEORGE PORTMANN.

MILLIGAN, SIR WM. : *Chronic Catarrhal Otitis Media—Some Thoughts and Suggestions.* "Practitioner." January, 1921.

MILLIGAN contributes a thoughtful paper on catarrhal middle ear disease—a subject unfortunately full of failures, and with, at present, no bright spot of hope for the future. He emphasizes the importance of remembering that the early stage is one of exudation, and that it is not sufficient merely to remove the causal adenoids and then hope that nature will carry out the absorption of the exudate. Care is necessary in every case to see that all exudate is removed and membrane puncture is suggested as a good method of aiding this result in suitable cases. Inflation will only drive the exudate about the tympanum, and sooner or later it collects in the hypotympanum—exactly where it will be most harmful.

In the later stage—that of sclerotic change—he finds little or no use in massage, bougies, medicated injections, etc. On the contrary they may do harm. Artificial perforation of the membrane with a fine galvano-cautery point he believes to be a useful and too much neglected treatment. It is recognised how well many hear who have old perforations, and that loss in hearing power may follow cicatrization of the perforation.

Referring to ankylosis of the stapedio-vestibular articulation he doubts the frequency of this and bases his opinion on observations made during operative interference. He believes that many supposed cases of ankylosis are really fibrosis of the fossula rotunda. Even a limited fibrosis provides a barrier to the excursion of the endolymph, thereby antagonising the movements of the footplate.

J. STAFFORD JOHNSON.

ERATH, J. : *Vaccinotherapy in Oto-Rhino-Laryngology.* "Revue de Laryngologie, d'Otologie et de Rhinologie." No. 21. Vol. 41.

ERATH reports his results in the treatment of chronic Otitis Media and Sinusitis. The cases were selected in so far as only chronic ones were taken : and frankly operative cases (*e.g.* polypi, cholesteatoma, sequestra) were neglected.

Both stock and autogenous vaccines were used, the latter being the more active, 80 per cent. of cases resulted in a cessation of suppuration : 10 per cent. showed but little improvement, and 10 per cent. were failures.

Vaccine injections of increasing strength were given every four days till 16 or 17 had been completed. The interval of time was then lengthened to 6-8, and finally 10 days when clinical progress was observed. Where otorrhœa has stopped one to three injections at three week intervals suffice to finish the course.

With stock vaccines he found that in many cases it was sufficient to use that of the dominant organism to produce good results, the other organisms in the mixed infection tending to disappear at the

same time. In cases unaffected by stock vaccines recourse was had to autogenous ones. Children were found to bear proportionate doses well.

J. STAFFORD JOHNSON.

HARPER, J.: *The Tonsil and its functions*. "Glasgow Med. Jour." December, 1920.

DEALING first with development of the tonsil as an outgrowth of the lining epithelium of the second branchial groove, Harper looks upon the supra-tonsillar fossa as the real tonsil. The lymphoid tissue below is merely an overgrowth of the mesenchyme cells around some crypts lined with epithelial cells.

Clinically there is no evidence available to indicate that the tonsils form an internal secretion or excretion, such as is produced by the thyroid, thymus or parathyroids. Moreover the tonsils can be safely totally removed without the least fear of any harm accruing to the patient. Indeed nothing but good ensues when the tonsils are completely enucleated in children who exhibit signs of respiratory impediment as a result of their hypertrophy. It has been abundantly proved that cervical adenitis frequently has its *fons et origo* in infection of the tonsils, commonly of a tuberculous nature. The tonsils often are the original foci of infection in cases of acute rheumatism, arthritis and endocarditis.

Harper advocates early and complete enucleation of the tonsils, and removal of the adenoids which are always simultaneously involved in all cases in which it is suspected that these may be having an ill effect upon the well being of the patient.

T. O. G.

PORTMANN, G. (Bordeaux): *Mastoiditis and Sub-Occipital Pott's Disease*. "Revue de Chirurgie No. 9, 10, 11, 12." September, October, November, December, 1919.

"Mal de Pott sous-occipital" may sometimes be mistaken for a mastoiditis. Moure has noticed several errors of this kind, the writer also has had similar experiences.

These errors are to be regretted, as the consequences are often disastrous. They must be avoided as far as possible by a very minute and careful diagnosis.

Portmann gives a detailed topographical description of the region, which he names: "*La gouttière cranio-cervicale*."

Knowledge of this "gouttière" makes it easier to understand the pathogenesis and pathological anatomy of occipital disease and of mastoiditis with a deep cervical abscess.

These two affections, essentially different, may closely resemble each other when the mastoid perforation takes place on a level with the external and superior aspects of the "gouttière cranio-cervicale." Pott's abscess begins on the internal aspect of the same "gouttière." In both cases the pus collects in the space between

the bony cranio-cervical "gouttière," and the aponeuroses and upper cervical muscles : *the cranio cervical space.*

Symptomatology and differential diagnosis are carefully described. Whether there is mastoiditis or sub-occipital Pott's disease, the three following clinical stages are to be met with : 1. no cervical abscess as yet exists. 2. A cervical abscess exists. 3. Fistulation exists

Symptoms corresponding to each of these periods distinguish the two affections. These findings can be supplemented by suitable laboratory examinations (radiography, analysis of the pus, etc.).

In the following table important signs are shown which may influence the practitioner with regard to the diagnosis.

"Mal de Pott sous-occipital."

Mastoiditis.

(1) Spontaneous and provoked pain especially on the nape of the neck accentuated by the movements of the head.

(1) Spontaneous pains especially at the level of the mastoid.

(2) Absence of morphological modification in the mastoid region.

(2) Morphological modifications in the mastoid region.

(3) Premature and accentuated stiffness in the head and neck.

(3) Absence of, or very little stiffness in head or neck.

(4) Absence of auricular symptoms.

(4) Auricular symptoms.

II. Existence of cervical abscess.

(5) Spontaneous or provoked pains on a level with abscess.

(5) Spontaneous or provoked pains on a level with abscess and referred to the corresponding side of the head.

(6) Abscess rather regular without peripheral œdema.

(6) Abscess badly defined with peripheral infiltration and inflammatory reaction.

(7) Puncture of the abscess gives issue to clotty serous pus, not very thick, from which a cytological and bacteriological diagnosis can be made in the laboratory.

(7) Puncture of the abscess gives issue to a thick phlegmonous pus; proved by the laboratory to be non-tuberculous.

III. Presence of fistulation.

(8) A fistula with purple undermined edges and sometimes fungating, exuding thin pus.

(8) Fistula with regular red edges exuding phlegmonous pus.

(9) Radiography shows lesions of the upper cervical vertebra.

(9) Radiography shows no lesions of the cervical vertebra.

(10) The direction of the probe introduced into the fistula is towards the cervical column,

(10) The direction of the probe is towards the mastoid.

The diagnosis ought to be made with much care as the prognosis will be considerably affected if treatment unsuitable to the affection be applied; a special medical treatment corresponds to upper cervical "mal de Pott" immobility of the vertebral segment and puncture of the abscess, with injections of a modifying liquid. The treatment of mastoiditis is essentially surgical according to the method approved by Moure, and which comprises: (1) trephining and excavation of the apophysis; (2) opening of the cervical abscess.

To sum up the writer has called attention to a question as interesting to the general surgeon as to the oto-rhino-laryngologist, the importance of which can be judged by the disastrous consequences to which a false diagnosis may lead.

GEORGE PORTMANN.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

President—T. T. O'FARRELL.

Secretary—J. H. POLLOCK.

November 19, 1920.

PROFESSOR ADRIAN STOKES demonstrated Cultures of *Leptospira Ictero hæmorrhagica* and *Leptospira Icteroides*.

DR. WIGHAM showed a specimen of Chorion-Epithelioma.

DR. W. D. O'KELLY showed a tumour of the Dura Mater (see DUBLIN JOURNAL OF MEDICAL SCIENCE, January, 1921, p. 26).

DR. MORRIN showed a Carcinoma of the Antrum of Highmore removed by operation (see DUBLIN JOURNAL OF MEDICAL SCIENCE, February, 1921, p. 79.).

SECTION OF MEDICINE.

President—A. PARSONS, M.D.

Secretary—G. E. NESBITT, M.D.

December 3, 1920.

A Case of Bubonic Plague in Dublin.

DR. H. C. DRURY and SIR ARTHUR BALL reported a case of Bubonic Plague, (see *Dublin Journal of Medical Science*, February, 1921, page 63).

DR. SYNGE said that the gland removed by Sir Arthur Ball was about $1\frac{1}{2}$ inches in length. It was œdematous and hæmorrhagic. Smears from the gland showed very large numbers of Gram negative bacilli. These bacilli were short and thick, and stained darkly at both poles, the centre of the bacillus remaining unstained. Cultures on blood-agar after 36 hours showed small whitish grey colonies. These consisted of bacilli similar to those found in the direct smears of the gland. Cultures on salt agar after 3 days showed marked involution forms. A guinea-pig injected with material from the gland died after 7 days. It showed general œdema with areas of congestion. The glands in the groin were much enlarged, œdematous, and hæmorrhagic. The spleen was greatly enlarged and studded with large numbers of white spots. Smears of the glands and spleen, and cultures from the glands, spleen, and heart's blood all showed bacilli similar to those found in the patient's gland. A culture from the patient's blood on the 7th day of her illness was positive, but bacilli were not seen in a direct examination of blood films.

The morphological and cultural appearances, and the result of animal inoculation, proved that the bacillus found in the patient's gland was *B. pestis*, and that the patient was suffering from bubonic plague.

DR. BIGGER in describing the precautions taken by the Authorities to prevent extension of the disease, said that as no case had occurred in Dublin for 200 years, an entirely new problem was presented. Some connection with the shipping of the port might have been suspected, but this case had none, except that she lived near the docks. She had, however, a pet cat which slept in her bed, and which was in the habit of disappearing at intervals. This animal might have been infected by rat fleas, but it was not possible to ascertain the fact owing to its prompt destruction and disinfection by the Sanitary Authorities. No unusual mortality had been noticed among the rats at the docks, and the specimens examined were negative as regards plague. The usual measures of disinfection were adopted, and the Health Authorities in England and Scotland were notified. As no further case had been reported after the lapse of nearly two months this would probably prove an isolated case.

DR. W. F. LOWE had never seen a case of plague in his colony (B. Guiana), but it had occurred in Trinidad on two occasions to his own knowledge. He was surprised to hear that direct infection played such a prominent part—he thought the rat flea was generally accepted as the infecting agent.

SIR J. W. MOORE thought the introduction of plague into this country quite a possible event. A relative in the Royal Navy had told him on his return home after visiting Algiers and Lisbon, that Plague existed in Algiers and in Lisbon, both places in fairly close communication with the British Isles.

DR. SPEARES instanced an outbreak in a family in Malta, two

members of which died before the diagnosis was made. The laboratory attendant punctured his finger during an autopsy on one of the cases, developed plague and died.

DR. DRURY in reply, said that the entire credit of the case was due to Sir A. K. Ball, who recognised the inflamed gland as something unusual, and to Dr. Synge who had the courage to make what appeared at first a very improbable diagnosis. He did not suggest that direct infection in plague was a common route, but it had been shown to occur. He thought anti-plague serum more useful in prophylaxis than in treatment.

Acute Leukæmia.

DR. PURSER showed blood films of a case of acute leukæmia. The child, a male aged $3\frac{2}{12}$, was admitted as a case of acute purpura with temperature of 103° and pulse 128, died 36 hours after admission. The blood showed 72,812 leucocytes per c.m. of mononuclear type. Heart 50 per cent., red cells 2,800,000.

DR. SPEARES commented on the bluish appearance of the red cells in the films prepared with Leishman's stain, and said this was generally due either to the films having been kept a long time before staining, or to the stain not being sufficiently alkaline. On account of the peculiar staining, he found it difficult to pronounce on the character of the white cells, but he considered that the majority were myelocytes, myeloblasts, or metamyelocytes. He thought the case undoubtedly belonged to the myelogenous variety of leukæmia.

DR. NESBITT having seen the case on its admission to hospital, was much interested in the subsequent details. He was struck by the peculiar pallor, the petechial eruption, and the bloodstained oozing from the mouth, which had been present in some form in every case of acute leukæmia he had seen. He thought a bluish tint in the red cells was a common experience, and he did not find that it prevented recognition of the leucocytes, which often seemed to stain unusually well under these conditions. The patient was an exceptionally fine child, and the sudden occurrence of such a profound and mysterious disorder was quite inexplicable.

DR. ROWLETTE also often obtained a grey appearance of the red cells with Leishman's stain, but as regards the white he would judge more from their morphology. He thought the blood did not conform to either established type, but as usual in acute cases the cells more closely resembled the large lymphocytes, and this appearance was characteristic of the condition.

DR. PURSER in reply said that Dr Pollock had been responsible for most of the work on the case. He agreed that bleeding from the gums was a characteristic feature of acute forms of leukæmia. The stain used was probably bad, but he thought it likely that the alcohol was to blame.

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CARCINOMA HEPATIS,

By SIR JOHN MOORE, M.D., F.R.C.P.I.,
President of the Royal Academy of Medicine in Ireland.

The case which I submit to this Section of the Royal Academy of Medicine illustrates the rapidity which sometimes characterises the development of carcinoma of the liver.

The clinical aspect of the case may be described as follows. It is based on notes taken by my clinical clerk, Mr. Ivan Marais:—

On Thursday, October 21, 1920, M. W., vanman, aged 38 years, was admitted to a ward in the Epidemic Wing of the Meath Hospital as a case of right basic pleuro-pneumonia. He complained of having caught a severe cold about a week previously, the most distressing symptoms of his illness being pain, confined to the right shoulder blade and the lower part of the right side of the chest, and sleeplessness caused thereby. A dry cough developed two days later—that is, on Saturday, October 23rd. He stated that he had not slept for a whole week, owing to the pain in his shoulder and side. He had diarrhœa for several days before admission, but this ceased suddenly, and the bowels moved regularly while he was in hospital. His teeth were very bad and his tongue was dirty. His father had died about the time the patient was born, and a sister died of influenza during the recent epidemic. His mother and an only brother are alive and well.

The patient looked very poorly. He was pale, wasted, and feeble.

Physical examination revealed dulness on percussion over the base of the right lung, without much increase of vocal fremitus or resonance. A pleural rub was heard but not felt. At that time nothing unusual was detected about the liver, which certainly was not then much enlarged.

The urine was examined on October 24th and 27th. It was at first "muddy," and of a normal yellow colour. It became high-coloured (apparently from bile-pigment) later on. Its reaction was acid. The specific gravity was low (1012). Albumen was present in moderate amount. The urine was free from sugar. Urates deeply stained were deposited in abundance. At a later date, I found spherules of urate of ammonium and broken-up pus cells but no tubercasts. When the urine was allowed to stand and to become alkaline the deposit became "ropy." Some pus, therefore, obviously was present.

Sputum examination showed the presence of lanceolate diplococci in fairly large numbers (Pneumococci).

The normal ratio of respirations to pulse—1 to 4—was but little disturbed—the average rates being 26 and 100 per minute respectively. Only twice—on the evenings of October 24th and November 1st—did the axillary temperature touch 100° F.—in fact, after a few days' descent by lysis, the temperature became subnormal, with the exception of one reading of 101° on the evening of November 1st. About that date, however, a remarkable change was noticed: a fulness appeared in the epigastrium, and the area of liver dulness was found to be much enlarged. Also the liver was now easily felt below the right costal margin, and especially to the left of the notch in the middle line and towards the left. The lower edge of the liver was rounded. On palpation also, the organ was found to be almost smooth, and almost as firm and resistant as an amyloid liver. After that date (November 1st) the enlargement of the liver increased perceptibly day by day, until at last the area of hepatic dulness was found to be as great as 9 inches in the right

nipple line, thus extending more than 4 inches below the costal margin.

All this time there was no jaundice beyond a slight yellowness of the conjunctivæ. No report was made by the nursing staff as to any abnormality in the fæces as regards colour or smell. My colleagues and I came to the conclusion that the liver enlargement was due to malignant disease of very rapid development. The man's condition daily grew worse, and he died comatose at 7.15 p.m. on Saturday, November 13th, the temperature having fallen to 96.2° at 6 p.m., pulse 102, respirations 28.

The post-mortem examination was made by the House Surgeons, Dr. Thomas J. Lane and Dr. J. B. Maguire, to whom I am indebted for the following notes:—

“The body was extremely emaciated. No jaundice was present. There was very little fat in the subcutaneous tissues and mesentery.

“The lungs showed marked changes. Nodular masses were found scattered throughout the lower lobe of the right lung. The lower lobe of the left lung was markedly congested and partially consolidated. The pleura over each lung was adherent. The heart was small and atrophied, but there were no valvular changes.

“The liver was more than twice the normal size, extending below the umbilicus, and filling almost half the abdominal cavity. Its texture was dense and firm; the surface was nodular in places. The normal liver tissue was almost entirely replaced by carcinomatous tissue. The gall-bladder was normal.

“The stomach showed an hour-glass constriction. On opening the organ, a diffuse ulcerating cauliflower growth was seen.

“The spleen was very small in size.

“Both kidneys were congested, and showed fatty changes.”

As to the weight of the liver in this case—170 ozs.—Budd, in his “Diseases of the Liver,” 3rd Edition, page 407 (quoted by Murchison, 3rd Edition, page 241), states that a cancerous liver has been known to weigh 384 ounces, or about seven times the normal weight.

The absence of jaundice in rapid cases is probably due to acholia, the result of the wholesale destruction of the liver cells. As a matter of fact, however, jaundice is not so commonly present in carcinoma hepatis as many observers suppose. Of 91 cases of cancer of the liver collected by Frerichs, 52 died without ever having been jaundiced (Murchison, *loc. cit.* 243). Murchison observes: "If the bile-ducts are not compressed almost the whole of the secreting tissue may be destroyed without any jaundice resulting." Such compression is more likely to occur in cases in which the cancerous formation is in large masses—Farre's "Tubercles."

Again, and especially, Murchison truly tells us that "cancer of the liver always runs a rapid course. The medullary cancer often grows very rapidly, and is fatal within a few weeks or months." "In one case," he adds, "Dr. Farre calculated that in ten days the liver acquired an addition equal to 5 lbs." (Farre: "Morbidity Anatomy of the Liver," page 28).

The question of reflected pain as bearing on the differential diagnosis of lung or liver disease is of interest. Writing on "Tropical Abscess," Murchison¹ observes: "A sympathetic pain in the right shoulder and down the right scapula is not uncommon, especially when the abscess is situated on the convex surface of the right lobe, but in many cases it is absent." The same remark applies to cancer of the liver. Sir W. Hale White, in a monograph on "Tumours of the Liver," in Allbutt and Rolleston's "System of Medicine,"² states that in cancer of the liver "the patient usually, but by no means always, complains of pain in the region of the liver, both back and front, due probably to stretching of the capsule or to some local peritonitis; and, especially when this has occurred, the organ is tender, and he suffers from a cutting pain when he coughs." He adds: "Pain is often referred to the right shoulder-joint, a point of considerable diagnostic importance, and it may go down the right arm."

So far clinically. In explanation, we have to recall the following facts:—First, that the phrenic nerve arises chiefly

¹ *Loc. cit.*, p. 194.

² Vol. IV. Part I., 1908, p. 208.

from the fourth cervical nerve, but receives a branch from the third and another from the fifth. The fibres from the fifth cervical nerve occasionally come through the nerve to the subclavius muscle. Second, that the phrenic nerve contains motor and sensory fibres in the proportion of about two to one. Third, that when the phrenic nerve reaches the diaphragm it divides into branches, which pierce that muscle, and are distributed to its under-surface ("Gray's Anatomy." Twentieth Edition. 1918. Page 894).

But, "in addition to its supply from the phrenics, the diaphragm receives both motor and sensory nerve-fibres from the lower seven intercostal nerves at its rim. This double sensory innervation explains the varied distribution of the referred pains that may be felt in different cases of infection or inflammation of the diaphragm, such as may occur in pleurisy or pneumonia affecting its upper surface, on the one hand, or in peritonitis attacking its lower surface on the other.

"For example, if it is the more central part of the diaphragm that becomes inflamed in a case of acute peritonitis, the patient may complain of pain and tenderness in the area of distribution of the cutaneous branches of the fourth and fifth cervical nerves, with the result that disease of the shoulder-joint or supraclavicular region is erroneously suspected, and the peritonitis is missed.

"Contrariwise, if the periphery of the diaphragm chances to become infected in a patient with acute pleurisy or pneumonia, he may complain of acute pain and tenderness in the area of distribution of the cutaneous branches of the lower intercostal nerves, and may also exhibit rigidity of the underlying abdominal muscles, with the result that an acute intra-abdominal infection is erroneously diagnosed, and a laparotomy is performed for the relief of a supposed appendicitis, cholecystitis, or localised peritonitis."

I have preferred to quote the above paragraphs on the Applied Anatomy of the nervous supply of the diaphragm from "Gray's Anatomy" at length, because they illustrate and answer the question before us much better than I could possibly have succeeded in doing.

NASAL CATARRH.

By T. O. GRAHAM, M.C.; M.D.; D.P.H.; F.R.C.S.I.
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Mr. President and Gentlemen,

Before proceeding with the subject of my Address, it is my first and pleasing duty to tender my thanks to the Dublin University Biological Association for the great honour conferred upon me by electing me to the Presidency for the coming year.

When I scan the list of past Presidents, I cannot but be somewhat awed, and made sensible of the very great honour conferred upon me by the invitation to follow in the wake of such distinguished scions of biology in its widest sense. While fully appreciating my unfitness for such distinction, I can only hope that the toga of one of my predecessors may fall upon me, so that I may steer the good ship, "The Bi," through the year's sea of work till I hand over the helm to some more worthy successor.

In selecting a title for my Address I have chosen the expression which is commonly employed by patients to designate their symptoms when suffering from such widely divergent diseases as a "cold in the head," or acute coryza, anæmia, a broken nose, adenoids, syphilis ("snuffles" of infancy), a foreign body in the nasal cavity, suppuration in the accessory sinuses of the nose, malignant disease of the nose, infection of the nose with the gonococcus or diphtheria bacillus or the organisms of other infective fevers, and even chronic purulent otitis media, which drains via the Eustachian tube into the nasopharynx. This bogey expression is "nasal catarrh." The most frequent type of "nasal catarrh" is the ordinary acute "cold in the head," from which every individual suffers—some seldom, some frequently—during their lifetime.

An acute coryza is always due to bacterial invasion of the nasal cavity. Some predisposing cause may be present, which has lowered the local resistance of the nasal mucosa

to this invasion, such as nasal obstructions, which interfere with adequate aeration and drainage of the nasal cavities, general debility from overwork, or working in ill-ventilated, dirty and stuffy atmospheres.

The symptoms of acute coryza—viz., the initial "chill," nasal discharge and stuffiness, with lachrymation and sneezing—are so familiar as to only require mere mention.

If in the early stages we nipped the infection in the bud, by rest in bed or at least in a warm room, and sprayed the nasal cavity with a warm alkaline spray, to which menthol and eucalyptus may be added, took a good purge, and 15 grains of Dover's powder or of aspirin, or the well-tried and favourite ammoniated tincture of quinine, we would not so frequently disseminate the infection to our friends, with that truly altruistic benevolence which is so characteristic of a careless generation.

The public have searched in vain for centuries for a panacea to cure every cold, but it will be a potent remedy indeed which can be guaranteed to cure a coryza, which may be caused by a deflected septum, hypertrophic turbinals, syphilis, adenoids, tumours, or foreign bodies in the nose. A simple alkaline spray or douche may be efficient in some cases of catarrhal rhinitis, whereas all the waters of Jordan, or even of Abana and Pharpar, may be as ineffective as the multitudinous concoctions of the quacks and charlatans, so widely advertised in the Press, and guaranteed to free the sufferer from so-called nasal catarrh, no matter to what cause it may be due.

As a prophylactic against recurrent attacks of a "cold in the head," it may often be found necessary to assist in the all-important provision of free aeration and drainage of the nasal cavities and accessory sinuses by removing spurs from the septum by means of a saw or chisel, or by submucous resection of the cartilaginous and bony septum, or by removing polypoid hypertrophies of the turbinals by suitable forceps or the thermocautery, or by freeing the nasopharynx of adenoids.

With regard to the removal of adenoids, I would like to lay special stress on the necessity for what has been termed

“nasal drill.” This is most essential and important in the case of those children who have become pronounced mouth-breathers, with contracted nostrils and ill-developed nasal cavities, with a high-arched palate and prominent upper incisor teeth, are round-shouldered, and suffer from that condition of mental hebetude which is summed up in the expression “aproxia.” These children must be trained to breathe in and out through their noses with their mouths tightly closed. These exercises must be persisted in for some weeks after the operation till proper nasal respiration becomes automatic, involuntary and spontaneous.

Some enthusiasts even go so far as to assert confidently that all cases of enlarged tonsils and adenoids may be cured without operation if due care and attention are bestowed upon nasal drill.

While not fully in accord with this sweeping assertion, I do certainly believe that many cases of early, slight hypertrophy of tonsils and adenoids may be greatly benefited, and even cured, by such a course.

For obvious reasons, this line of conservative treatment is more likely to meet with a measure of success in the well-to-do of private practice than among the children who attend the out-patient departments of our hospitals.

In many cases of catarrhal rhinitis much benefit may be derived from a course of inoculations, with gradually increasing doses of an autogenous vaccine. The most common types of bacteria present in cases of catarrhal rhinitis in this country are *B. catarrhalis*, pneumococcus, staphylococcus, streptococcus, *B. influenzae*, and occasionally *B. diphtheriae*.

In the case of the last-named, I have sometimes found marked benefit from the injection of antidiphtheritic serum, both in those cases in which a membrane was present as well as in a few chronic cases without membrane formation.

Recently I have frequently found Vincent's spirillum and fusiform bacillus in swabs from the pharynx and larynx of patients who complained of post-nasal catarrh, but in whom I have been able to discover no evidence of nasal sinus infection nor obvious pathological condition in the nose and

throat. These patients frequently have a mild pyorrhœa alveolaris, in which the specific organisms of Vincent are also detectable.

In such cases a few applications of an emulsion of salvarsan or novarsenobillon in glycerine have worked miracles in banishing both the pyorrhœa and the nasal catarrh, which is often associated with recurrent attacks of mild sore throat. In this connection I would like to call attention to the fact that many cases of recurrent sore throat, which were attributed quite rightly to pyorrhœa alveolaris, can now be cured without sacrificing the teeth by the simple expedient of local treatment of the gums with salvarsan or other arsenical compounds.

Simple chronic catarrhal rhinitis.

This is most commonly due to, or at least associated with hypertrophic conditions of the turbinals or spurs and deviations of the nasal septum.

The benefit to be derived from the operation of submucous resection of the septum to remedy spurs or deviations which have caused or maintained a chronic rhinitis can scarcely be over-estimated. The rationale of this operation is once again to effect adequate aeration and drainage of the nasal cavities.

Simple hypertrophies of the turbinal bodies may be reduced by means of suitable forceps, such as Hartmann's, or by means of the electrocautery. Whichever method is employed, it is advisable to avoid removing too extensive an area of mucous membrane. Such a measure might be fraught with the danger of inducing an atrophic condition of the nose and naso-pharynx, which in its consequences and effect upon the general health and comfort of the patient is more disastrous than the original complaint.

If the hypertrophy is very marked and becomes polypoid, the cold snare may be found the most useful instrument to free the nasal passages of the obstruction, and provide free aeration and drainage. One must not lose sight of the fact that polypoid hypertrophies of the turbinals are frequently only a symptom of sinus suppuration, and not a disease

per se. It, therefore, becomes incumbent upon the rhinologist to satisfy himself by careful investigation of the accessory sinuses that these are free from infection before unnecessarily removing the turbinal bodies, which will usually spontaneously subside when the sinus suppuration, if it exists, is cured.

In some cases the snaring of a polypus from the middle meatus of the nose may effect a cure of the sinus suppuration in the frontal, ethmoidal or maxillary cavities by providing free drainage, but usually it will be found necessary to perform some more radical operation on the sinus involved. The reason of this is that the polypus one removes is only one of several which has protruded from the sinus. Others are still lurking in the recesses of the cavity, and will rapidly spring forth into view. One has, therefore, unwittingly undertaken the task of lopping off the Hydra's head, more appearing as each one is removed.

If the polypus has grown to a considerable size and has filled and obstructed the nasal cavity, the suppuration is very liable to spread to the other sinuses, so that one arrives at a condition of pansinusitis. The cure of such a condition, in which the frontal, ethmoidal, maxillary and sphenoidal sinuses are all simultaneously involved, becomes an undertaking commensurate with the Herculean labour of cleansing the Stables of Augeas.

There are two diseases so commonly associated with abnormal conditions in the nose, such as hypertrophic rhinitis, polypi and septal deviations, as to arrest our attention in discussing nasal catarrh. I refer to hay fever and asthma. They occur frequently in the same individual or in members of the same family, particularly in young adults of a neurotic temperament among the upper classes.

Hay fever is in many instances a misnomer. The paroxysms of sneezing, coryza, lachrymation and suffused conjunctivæ may be induced by the pollen of hay or other plants, or even by the emanations from certain animals.

One may find pathological conditions in the nose, such as polypoid turbinals or deflection of the septum, the removal of which may permanently cure the condition. On the

other hand, one may see no obvious predisposing cause, but hypersensitive areas on the turbinals or septum may be detected with the picbe, the cauterization of which may effect a cure, or at least diminish the frequency and severity of the attacks.

It has also been claimed that irrigation of the maxillary antra may afford relief, on the hypothesis that the condition is due to simple catarrh of the antra.

Dunbar advocates the use of a serum which he calls Pollantin. This may be applied locally as a powder to the nasal mucosa or injected subcutaneously.

Freeman has more recently recommended the injection of a pollin toxin, which he calls "Pollaccine," as a prophylactic against true hay fever. The inoculations should be regulated by the ophthalmo reaction of the toxin for each individual, and the immunization should be effected in Spring, before the usual period of the attacks.

I have tried "Pollaccine" on several occasions, and have found it of benefit in those cases in which the attacks were definitely attributable to hay.

Asthmatic attacks may also frequently be warded off by removing nasal polypi and septal deviations.

Many an asthmatic patient has thereby been relieved of the distressing sleepless nights of acute dyspnoea, and afforded the comfort and cure which stramonium and nitre cigarettes and sprays of cocaine and atropine have failed to provide, though their devotees have persisted in their worship for many years. I do not claim that all cases of asthma are permanently cured by nasal operations, but I do claim that relief is furnished sufficiently often as to demand that the nasal cavities of all asthmatics should be set in order.

A careful study of the anatomical structure of the nasal cavities and accessory sinuses will afford an explanation of the causation of sinus involvement and of their chronicity. This disposition to fail to clear up after infection is due to inefficient drainage, which may occur in consequence of the unfavourable position of the natural ostium, or as the result of occlusion of the opening by swollen mucosa or polypus. A thorough knowledge of the relations of these sinuses to

the cranial cavity and orbit will also afford a solution to the difficulty of accounting for certain symptoms and complications which arise, and will materially assist in deciding upon the method of treatment to relieve them.

When a nasal sinus becomes infected advice may be sought on account of the nasal or post-nasal discharge—nasal obstruction or stuffiness, general malaise (with anæmia), loss of weight, anosmia or kakosmia, rheumatism, indigestion and dyspepsia, headaches, inability to concentrate on work, cough, asthma, sore throat, paryngitis, inexplicable pyrexia, intracranial or orbital and ocular complications, such as optic neuritis and optic atrophy. All or any of the sinuses may become involved as the result of an acute cold in the head, influenza, measles, or other infective fevers, foreign bodies in the nasal cavities, malignant disease, and injuries. In the case of the maxillary antrum, additional sources of infection arise from carious bicuspid or molar teeth or occasionally from septic dental cysts, which discharge their contents into the antrum.

In the acute infections some tenderness can usually be elicited by pressure over the sinus involved. This is most marked in those cases in which the drainage has been completely arrested by closure of the natural ostium with swollen œdematous mucosa. When this occurs the pain, which is usually referred to the frontal region, irrespective of which sinus is involved, may be so severe and the toxic symptoms so pronounced, that the patient becomes stuporose. Sometimes the symptoms may somewhat resemble those of meningitis, but if immediate drainage of the retained discharge be effected, these alarming symptoms almost instantaneously disappear.

If the discharge becomes retained for more than a few hours, there will usually be a red tender œdematous swelling of the tissues over the sinus.

The pain is greatly increased by straining or stooping or blowing the nose.

On examination of the nasal cavity one sees a red and congested mucosa of the turbinals, and pus may be seen in the meatuses.

Some assistance in diagnosis and in locating the origin of the pus may be obtained by observing the position of the discharge. In the case of the frontal, anterior ethmoidal and maxillary antrum the discharge appears under cover of the middle meatus and on the inferior turbinal, whereas the posterior ethmoidals and sphenoid drain above the middle turbinal, and the discharge tends to pass into the nasopharynx. During the night this discharge dries upon the posterior pharyngeal wall, from which it is dislodged in the morning with great difficulty after much hawking and coughing. Many cases of so-called pharyngitis sicca are in reality merely indications of sphenoidal sinus suppuration.

Two very useful methods of diagnosis are at our disposal for the purpose of locating the source of a purulent nasal discharge—viz., transillumination of the sinus and *x*-rays.

Of these two the *x*-rays is the more reliable test. Transillumination is only of slight assistance in the examination of the frontal sinuses. The rays of light from a small electric lamp enclosed in a rubber or vulcanite jacket are allowed to pass out through a small opening, which is directed upwards, under the floor of the frontal sinus at the upper and inner angle of the orbit in a dark room. Relative darkness over the anterior wall of the suspected frontal sinus as compared with the sound side would suggest purulent infection. Many errors may, however, arise in connection with this test. Thus, there may be thickening of bone and periosteum, the sinuses may be of unequal dimensions, so that one sinus transgresses the middle line, and may be illuminated from the opposite side.

For the transillumination of the maxillary antrum the unshaded lamp is placed in the mouth and the lips closed. Normally, one sees the pupil and sclerotic illuminated, a bright crescent of light just below the infraorbital border and the lachrymal tache along the side of the nose inside the inner canthus. If the antrum is occupied by polypoid mucosa and pus these parts will remain dark, as compared with the sound antrum. Finzi and Hett have demonstrated the pitfalls of this test, and have proved the superiority of the *x*-rays photograph as a diagnostic aid. Moreover, the

x-ray photograph is of service in defining the limits of the sinus prior to operation, so that one can plan one's operation beforehand.

Perhaps the most useful and certain method of diagnosis of sinus suppuration is irrigation of the sinus, frontal, maxillary and sphenoidal. The test is not applicable to the ethmoidal labyrinth, except by a process of exclusion, owing to the impossibility of finding the individual openings. The simplest method of irrigating the antrum is by puncturing it with a trocar and cannula through the inferior meatus under cover of the inferior turbinal. If the puncture is made through the maxillary process of the inferior turbinal the bone is quite thin, and usually offers but little resistance, so that it can be carried out painlessly under local cocaine anæsthesia. Indeed, the antrum may be drained through the inferior meatus of the nose by making a wide opening below the inferior turbinal under local anæsthesia.

To avoid errors of diagnosis, the nasal cavity should be cleansed before irrigating the antrum. If pus is then obtained on washing out the antrum, we may conclude that the antrum is the source of the pus. One fallacy may, however, arise. It sometimes happens that pus from a frontal sinus may have gravitated from the fronto-nasal duct along the hiatus semilunaris into the antrum, which merely acts as a reservoir. In this case, however, it will be observed that pus rapidly reappears in the middle meatus after irrigating the antrum, and since the antrum has been cleared of pus, its source must be the frontal or anterior ethmoidal cells.

To confirm the diagnosis of frontal infection one passes a cannula under cover of the middle turbinal—the anterior portion of which may be removed to facilitate the manipulation—into the frontal sinus. Considerable difficulty in entering the frontal sinus may be encountered in those cases in which there is a very narrow nasal cavity, when the middle meatus is compressed by an enlarged middle turbinal, or an anterior ethmoidal air-cell projects forwards as the bulla frontalis and constricts the fronto-nasal canal. Again, the nasal crest may project abnormally backwards

and obstruct the passage. On inflating the sinus with air or on irrigating the cavity, pus is seen to issue from under the middle turbinal.

To reach the sphenoidal sinus it is generally necessary to remove the middle turbinal almost completely, under cocaine anæsthesia. One can then see the ostium opening into the sphenoidal recess. A cannula can now be inserted into the ostium and the cavity inflated or irrigated. An escape of pus will confirm the diagnosis.

It is unusual to find the frontal sinus involved without simultaneous infection of the anterior ethmoidal cells. Similarly, the posterior ethmoidal cells are generally concurrently infected with the sphenoidal sinus. In any case it will frequently be found necessary to remove the middle turbinal and posterior ethmoidal cells to gain access to the sphenoid. To ensure adequate drainage of the frontal sinus one must inevitably remove the anterior portion of the middle turbinal and some of the anterior ethmoidal cells, whether the intranasal or external operation is undertaken. Many cases of acute sinus infection subside spontaneously under conservative treatment with rest in bed, hot fomentations, diaphoretics, such as Dover's powder or aspirin, warm alkaline nasal spray or inhalations of steam impregnated with menthol and compound tincture of benzoin. Drainage may be facilitated by the application of cocaine and adrenalin to the middle turbinal and middle meatus to reduce the obstruction created by congestion and œdema of the mucous membrane around the frontal and maxillary ostia. Further drainage may be effected by the removal of the anterior portion of the middle turbinal. The cavity may be irrigated through a cannula passed into the sinus. In the case of the maxillary antrum, the cavity is more easily irrigated after puncture through the naso-antral wall under the inferior turbinal. If the antrum is obviously infected through a carious tooth-stump, the tooth should be extracted, and the opening through the socket enlarged with a drill. The opening thus made may be kept patent for purposes of irrigation by inserting a rubber plug up into the antrum. Daily lavage may then be carried out till the

antrum is free from infection. Time does not permit me to deal adequately with the radical surgical treatment of sinus suppuration and the complications. I can only mention the commoner procedures employed. In all cases our aim is to secure free drainage at the most dependent part of the sinus.

As already mentioned, the frontal sinus may be dealt with intranasally or externally. The intranasal method has been previously considered.

The external operation is advocated by many rhinologists as affording better access to the sinus, and also because by this route the entire infected and polypoid lining of the cavity can be removed from all its recesses after the anterior wall of the sinus has been removed. The fronto-nasal duct may be enlarged and the anterior ethmoidal cells removed, thus providing free drainage of the sinus through its floor into the nose. Particular attention must be paid to the so-called orbito-ethmoidal cells, which may be found to pass out under the frontal sinus in the orbital plate of the frontal bone. The skin incision through the eyebrow may be sutured up, except for a small drainage opening at its inner end. The cavity gradually becomes filled in with granulation tissue. Such is, roughly, the outline of the Ogston-Luc operation.

Killian, however, advises a more extensive operation, which is particularly adapted to cases in which the ethmoidal labyrinth is grossly involved. He removes the whole floor of the sinus and drains it through the *os planum* of the ethmoid (which is removed with the ethmoidal cells) into the nose. The posterior wall of the sinus must be treated with the utmost respect. The degenerated lining of the cavity must be separated carefully, and not curetted. Curetting entails damage to the bone, and possibly perforation, with subsequent risk of meningitis and brain abscess. One word of caution is necessary in operating upon the frontal sinus by removing the anterior wall, particularly in acute infections or acute exacerbations of chronic suppuration. In these cases it is wise to cause as little injury to the bone as possible, in view of the risk of infecting the cancellous tissue and setting up osteomyelitis of the frontal bone, which usually proves fatal. In acute cases it is wiser to merely

open and drain the sinus anteriorly, and to wait till the acute inflammation has subsided before undertaking radical operation. To obviate the danger of osteomyelitis, many rhinologists now advocate the intranasal route for operation, as it is stated that this calamity never occurs after the intranasal operation.

Maxillary Antrum.

The most universally useful operation for the radical cure of maxillary antrum suppuration is the Caldwell-Luc operation, which consists in opening the antrum under the cheek, removing the degenerated polypoid mucous lining, creating a large drainage opening into the inferior meatus of the nose, and then suturing up the tissues over the opening in the anterior wall. The anterior end of the inferior turbinal may be left intact unless it interferes with the patency of the drainage opening. Irrigation of the sinus may be carried out through a cannula introduced into the antrum through this drainage opening till the antrum is clean.

Sphenoidal Sinus.

To secure adequate and efficient drainage of the sphenoids the anterior wall must be removed by means of a sphenoidal punch introduced into the ostium, which has been enlarged by means of suitable hooks and burrs. Rarely can this be effected without previous removal of the middle turbinal and the posterior ethmoidal air-cells, one of which may be found lying on the roof of the sphenoid in contact with the optic nerve. In operating upon the sphenoid, great care must be taken to avoid damaging the roof, and causing a spread of the infection to the meninges and brain, the cavernous sinus and the ocular nerves.

The importance of suppuration of the accessory sinuses of the nose becomes apparent when we consider the many complications which may arise as the result of direct extension or septic absorption. These complications are not infrequent, and are far-reaching in their effects.

In consequence of a spread of the infection through the walls of the sinus, or possibly through the anastomosing blood-vessels and lymphatics, we may have an orbital cellulitis

which causes proptosis, and outward dislocation of the eyeball, with diplopia and oedema of the lids and conjunctiva. The close relationship of the sphenoid to the optic nerve will account for many obscure cases of optic neuritis and optic atrophy and reduction of the visual fields. The proximity of the sphenoid to the third, fourth and sixth cranial nerves will likewise explain many cases of oculomotor paralysis and strabismus.

Sometimes the infection spreads to the cavernous sinus and causes septic thrombosis, which is ushered in with rigors, pyemic temperature, exophthalmos, and marked swelling and oedema of the lids.

Hajek has shown the existence of a direct communication between the blood-vessels of the ethmoids and sphenoids with the dura mater, which may account for some obscure cases of meningitis and extradural abscess. Moreover, we may also find a direct communication through the roof of the frontal or ethmoidal cells or the sphenoid, with intracranial suppuration.

Onodi describes the semicanalis ethmoidalis, which transmits the ethmoidal veins and brings the frontal and ethmoidal cavities into communication with the anterior fossa of the skull.

Many other eye complications are frequently referred to me by my ophthalmic colleagues at the Royal Victoria Eye and Ear Hospital for examination of their nasal cavities and sinuses when seeking the cause of obscure cases of conjunctivitis. Phlyctenular conjunctivitis and keratitis are not uncommonly cured by the removal of adenoids or hypertrophies of the turbinals.

Chronic purulent dacryocystitis is now often relegated to the rhinologist for cure. During the past year I have operated on 25 of these cases, which have failed to derive benefit from probing and syringing of the nasal duct. Portion of the lachrymal bone and nasal process of the superior maxilla are removed intranasally under cocaine, and the lachrymal sac is then drained directly into the nose by removing its inner wall. The results have been satisfactory; instant relief from the epiphora and purulent discharge being

secured for the patient. Blepharospasm is also frequently induced by inflammation of the sinuses. Recently I operated on a woman with pronounced blepharospasm of the right eye. Transillumination of the right antrum was darkish, as compared with the left antrum. No pus was found on irrigating the antrum. However, on opening the antrum, the roof was found covered with polypoid mucosa, the removal of which completely cured the blepharospasm. Chronic irido cyclitis, with punctate deposits on the back of the cornea, may be due to sinus suppuration, the cure of which cures the eye symptoms.

Spluder considers that headaches and migraine arising from sinus suppuration are the result of hyperplastic osteitis, which Wright has demonstrated around the nerve canals and foramina.

When the pus from suppurating sinuses is swallowed for a long period, serious disorders of the digestive system may ensue, such as gastritis and dyspepsia. It is not improbable that some of Lane's kinks may be cured by the rhinologist, and so save to the patient several feet of the colon, which may or may not subserve some useful purpose in his internal economy.

Pharyngitis and laryngitis are not infrequent accompaniments of sinus suppuration.

While writing this paper a lady was sent to me for treatment of what, on laryngoscopic examination, closely resembled, and had been diagnosed, a tubercular laryngitis. She had a constant cough, with crepitations in both apices. On examination, however, of the sputum no tubercle bacilli were found, but the abundant purulent sputum was teeming with pneumococci. The radical cure of an unsuspected antrum filled with pneumococcal pus cured the "tubercular laryngitis" and the cough and crepitations. Owing to constant absorption of pus and toxins anæmia, and general debility, and chronic rheumatoid arthritis will frequently drive the patient to seek advice from his physician, whereas his cure would be more speedily effected if he consulted the oracle of that enemy of "nasal catarrh"—the rhinologist.

Deafness and ear complications, such as acute and chronic

otitis media, are so often associated with, and indeed originate from, pathological conditions in the nose and nasopharynx, as to demand close attention to these parts as a means of treatment and cure.

A CASE OF SPOROTRICHOSIS.

By WALLACE BEATTY, M.D.

John Sarsfield, aged 12, was brought by his mother to see me at the Adelaide Hospital on June 10th, 1920. One year previously he fell and hurt the palmar aspect of the right hand near the wrist; suppuration followed, and later the skin of the affected part of the hand became dry and rough.

Some months after this lesion occurred, a small circular abscess developed on the extensor aspect of the right forearm, and two minute elevations, pea-sized, at inner surface of right arm. The boy had also ringworm of the scalp.

The objective signs were:—

- (a) Over the central side of the right hypothenar eminence (the site of the injury) the skin was dry, rough (almost warty), and infiltrated. The surface shewed dry, horny scales, arranged in a mosaic.

The extent of area affected was one inch in antero-posterior diameter, and three-quarters of an inch in transverse diameter.

- (b) The forearm lesion was about an inch in diameter, circular, and when he first came to me it was a red, raised area fluctuating (evidently a subcutaneous abscess). It was situated two inches above the wrist.
- (c) There were two minute pea-sized lesions in the skin of the inner side of the arm.
- (d) Besides this there was scalp ringworm, with some impetigo.

When I saw the boy I suspected sporotrichosis of the right

hand and arm. The abscess on the forearm was aspirated with a hypodermic syringe, but the culture yielded a negative result.

In spite of this negative result I felt so strongly in favour of the diagnosis of sporotrichosis that I thought it well to make further trials. The abscess had opened centrally, so I made cultures from the pus pressed out, and also by inserting the platinum loop into the cavity of the abscess. One of the culture tubes showed a white culture, mixed with a staphylo-coccic one. By subculture I succeeded in obtaining a pure growth of sporothrix from this white culture.

This sporothrix seems to be a different species from the sporothrix of my first case, exhibited here in 1917.

It may be, I think, Schenck's variety—white and snowy, with little tendency to darken in colour.

The sporothrix of my first case was, I believe, de Beurmann's.

The culture first white, then brown, then black.

The boy has still ringworm of the scalp. I made a culture of this. It is microsporon.

From the great number of cases which de Beurmann and Gougerot have collected, one of two conclusions must be drawn: either that sporotrichosis is very rare with us, or that we are continually overlooking it.

The lesions of sporotrichosis resemble for the most part syphilitic and tubercular lesions, and have frequently been mistaken for these. In the presence of syphiloid or tuberculoid lesions there are three fungus-affections to be thought of when making a diagnosis—1. Actinomycosis; 2. Blastomycosis; 3. Sporotrichosis.

Actinomycosis is usually readily recognised by the presence of yellow grains in the pus, and is accordingly usually easily recognised, and is now, I think, seldom overlooked.

Blastomycosis resembles tuberculosis verrucosa—and the diagnosis is made both by extemporaneous examination of the pus for budding fungi and by culture.

I have not ever met with a case, or, at any rate, have not recognised it, though I have sought it.

Sporotrichosis for recognition always requires culture.

The medium of choice is Sabouraud's Glucose Agar. The fungus grows readily and best in the cold.

De Beurmann and Gougerot quote these remarks of Professor Landouzy.

The simplicity and rapidity of the culture in the cold on glucose peptone agar is such that one must demand from every student and every practitioner that he should know how to do it. A laboratory is not indispensable, since it does not need an incubator or a microscope. The microscopic aspect of the culture is pathognomonic.

The polymorphism of sporotrichosis must be continually borne in mind. There may be epidermic lesions, dermic lesions, hypodermic, muscular, osseous, and mucous membrane lesions.

Some lesions resemble syphilitic or tubercular gunmata, some resemble a septic lymphangitis; some resemble ganglia, tubercular synovitis, and osteitis; some vegetating tubercular lesions.

There are sporotrichotic stomatitis, pharyngitis, laryngitis. It would seem well if we had always at hand tubes of glucose agar (Sabouraud's formula), and attempt cultures from the pus or scales or secretion of the various syphiloid and tuberculoid lesions we meet with.

STONE IN FEMALE BLADDER.

By CAPTAIN FRANK J. DUNNE, Visiting Physician,
Dublin Union.

J. M., aged 15, 8/12, was admitted to the Children's Infirmary, Dublin Union, on 5th October, 1920.

The history she gave was: on 2nd October she felt a sharp pain in bottom of stomach, and went to bed; the following day got up, feeling better; went to Mass, on her way back the pain returned; was stuped on 4th; got a bottle from the doctor, "which did her no good." On 5th, the doctor came to see her, and ordered her into hospital. Diagnosis, queried appendix.

On admission, temperature was 99°; pulse, 92, fair; pain over abdomen; all below umbilicus not localised; very moderate distension.

Castor oil was given and hot stupes.

On 6th, when I first saw her, the temperature was 101°; no actual pain, but well-marked tenderness over the bladder; frequency of micturition reported by sister, but not complained of. Urine examined; sp. gr. 1010; very slightly acid, loaded with albumen.

From this on the girl made a steady recovery.

13th October—Urine, sp. gr. 1012, nearly neutral; albumen present in small quantity, with some mucopus.

At this time she was apparently in good health. Her only complaint was, that if the night nurse did not call her twice during the night she was apt to wet the bed.

20th October—On passing a metal catheter I struck a stone, which appeared fixed in neck of the bladder.

21st October—Two stones were removed from the bladder by my colleague, Dr. P. D. Sullivan, F.R.C.S.I.

The urethra was dilated by forceps, Bozemann's catheter and the finger. The first stone, which was round, and slightly larger than a shilling, was easily grasped with a forceps at the expense of some of its phosphatic covering, and weighed 176 grains; the larger stone was fixed with its long axis transversely to the urethra, was slightly larger than half-a-crown, with a hollow to receive the first round stone, and weighed 296 grains. It was gradually worked out by digital pressure without any laceration or bleeding. The bladder was washed out with boric solution.

The patient passed a good night, no rise in temperature, and was called once to urinate.

24th October—Urine examined; sp. gr. 1010, acid, fairly clear, some mucous and phosphates. Could now sleep all night without getting up.

7th November—Complete control of bladder; 14 ozs. of urine drawn off by catheter; sp. gr. 1012, faintly acid, no albumen or mucous, slight trace of phosphates.

There are several interesting points about this case:—

1. The occurrence of stone in a young girl who had never been outside the area supplied by the Vartry.

2. The absence of any marked symptom, renal colic, pain, etc., to indicate the presence of stone.

3. The great dilatability of the young female urethra.

4. The rapid, uneventful recovery and early control of the bladder.

Personally, the only thing that drew my attention to the bladder as being the seat of trouble was the presence of muco-pus, as I had seen several cases of stone in young people in Egypt where muco-pus in the urine, with frequency of micturition were the only indications of stone until the sound or metal catheter were used.

REVIEWS.

- (1.) *Pharmacology*. By Douglas Cow, M.D. London: J. and A. Churchill. 1920. Pp. 132.
- (2.) *A Treatise on Materia Medica and Therapeutics*. By the late Rakhalidas Ghosh. Eighth Edition. By B. H. Deare and B. N. Ghosh. Calcutta: Hilton and Co. 1920. Pp. 698.
- (3.) *The Extra Pharmacopœia*. By W. H. Martindale and W. W. Westcott. 17th Edition. Vol. I. Lewis and Co. 1920. Pp. 1,115.

(1.) THIS little book is one of a set styled the "Students' Synopsis Series," which is arranged to cover the chief branches of Medicine and Surgery.

It represents condensation carried to its utmost limit, and is essentially a refresher, or cram book for examinations. The information is accurate and up-to-date, and many useful diagrams are interspersed. An elaborate table is supplied of the seats of action of drugs, which is useful for reference.

There is scarcely any allusion to *Materia Medica* in its restricted sense, but a confusing and unnecessary waste of space is occasioned by the printing of intricate chemical constitutional formulæ of organic drugs, which no ordinary student could possibly interpret or remember.

Thus, pp. 28-29 are filled by the graphic formulæ of 16 arsenical derivatives which have been proposed for use from time to time, some of which the reviewer never heard of.

On p. 48 the student is bewildered by the complex graphic formulæ of ecgonin, tropin, cocaine, and atropin.

This book is dedicated "to that great army of medical students, some 80 per cent. of the whole, who in examinations are within measureable distance of the Rubicon that divides the approved from the rejected!!"

(2.) THE first edition of this book appeared in 1901, and later editions were favourably noticed in this Journal in 1914 and 1917. We have frequently consulted the 6th Edition, and now welcome the 8th Edition, a sufficient proof of its well-deserved popularity and success. Although not enlarged by a single page, it has been carefully revised.

It is a thoroughly reliable, useful, and up-to-date book, and we can unreservedly recommend it to our readers.

This edition, like its predecessor, is adapted to the last edition of the B.P. For Indian students, especially, it is the best work they could procure, and gives vernacular Indian synonyms for nearly all the drugs in the B.P.

(3.) This amazing and indispensable *multum in parvo* has reached the almost unprecedented dignity of the 17th Edition, and it is safe to prophesy for it a continued and increasing success.

No practitioner, whether physician, surgeon or specialist, can afford to neglect it, and the amount of reliable information compressed into its 1,100 pages is simply marvellous.

The last edition was issued in January, 1915, and the preface to this edition, travelling far outside the usual lines of a preface, is a frank discussion as to how far the war has affected chemical and commercial industries.

It is pointed out how quickly, and unexpectedly, the brilliant synthetic chemists in the German factories, numbering many hundreds, transferred their labours to the manufacture of explosives and poison gases, and how the whole range of inorganic and organic chemistry was ransacked to provide villainous agents of destruction.

Sir Ronald Ross has remarked that Great Britain had reached her lowest point of intellectual development before the war. Surely the chief lesson of the conflict is the urgent need of greater and more widespread scientific education. If this is not seen to at once the nation will lose its right to complain of loss of trade, and the astute and laborious Hun will again succeed in strangling our feeble efforts.

It is needless to enter into any details of the contents of so well-known a book.

Revision has been carried out with scrupulous care and thoroughness, and it is safe to say that no item of scientific interest has escaped the watchful eyes of the authors.

Let every practitioner hasten to provide himself with a copy of this incomparable work, which will prove to him an ever-useful friend and companion.

W. G. S.

Les Antigènes et Les Anticorps. By M. Nicolle, Institut Pasteur. Masson et Cit. Pp. 80. 4 f. 50.

MONSIEUR NICOLLE gives us the substance of the Harben Lectures, delivered before the Institute of Public Hygiene, London, in a short volume. He has succeeded in concentrating his ideas into a short space, and has not attempted to give us the experimental evidence on which they are based. The book has left us with a clear conception of the subject as Monsieur Nicolle sees it. The first chapter is devoted to his definitions and principles of immunity, the second chapter deals with their application to diagnosis, and the last to the therapeutic application. Many of his conceptions are new to us, and they have, we believe, advanced the study of immunity in simplifying the subject. We only wish that Monsieur Nicolle had seen fit to expand his lectures into a more considerable volume. The clarity of the style and the simplicity with which the argument is put are a lesson in themselves. The book should be of value to clinicians and laboratory workers. We can confidently recommend it.

B. S.

Tumours complicating Pregnancy, Labour and the Puerperium, being the Lettsomian Lectures delivered before the Medical Society of London by Herbert Spencer, M.D., B.S. (London), F.R.C.P., Obstetric Physician to University College Hospital. 8vo. London: Harrison and Sims. 1920. Pp. 78.

THIS will prove to be a most useful reference work for those who are investigating the subject of tumours and the pregnant state. We have already read these lectures in the "British Medical Journal," and we welcome the splendid manner in which they have been produced as being an addition to English gynaecological bibliography. The work is a record of the author's experience, extending over 32 years, and the reports of his methods, statistics and of special cases are very valuable, especially as the book is in scholarly English, and makes delightful reading.

B. S.

Modern Surgery, General and Operative. By Professor DA COSTA, Philadelphia. W. B. Saunders Co., Philadelphia and London. 1920. Pp. 1,650. Price £1 17s. 6d. net.

IN a delightful preface to this, the eighth edition of his well-known text-book, Professor Da Costa completely disarms his critics in advance by pleading the difficulties of adequate revision on active war service. Such a plea was quite unnecessary: rather is he to be congratulated on having omitted so little that might have been overlooked.

Wide and discriminate reading, evincing the most ample knowledge of the literature of his subject, a scrupulous fairness in appraising other men's ideas and methods, even when at variance with his own, a transparent honesty, and complete absence of dogmatism, are the most attractive features of this book. Add to these a trenchant, clear style, with a happy tendency to epigram, and one can understand the pleasure it is to the tired reviewer to turn the pages of such a book as this, with its not infrequent atmosphere of general, extra-surgical culture. Such aphorisms as "a tired mind, like a tired hand, tends to become shaky," "powerful purgatives are powerful depressants," "spare your patients, for Spartans are few," crop up every now and then, with the most refreshing effect, in the midst of other more rigidly surgical information. His advice to the surgeon, in the words of Sydney Smith, "to have the courage to be ignorant of a great number of things in order that he may avoid the calamity of being ignorant of everything," is amongst the happiest of his references.

We do not know if Dr. Da Costa is an old pupil of Johns Hopkins: his dedication to that school and the chief of its surgical staff, Halsted, would seem to indicate this: and the stamp of "Aequanimitas" is readily apparent. His professorial lectures, we feel sure, must be of unusual attractiveness, for the perusal of his book, the crystallisation of much thought and wide knowledge, has been a real pleasure. We are not so sure that, for students in this country, it would pay to read Da Costa for an examination, but of this, at least, we are sure, that the practitioner who is wise or

fortunate enough to possess it will rarely consult its pages without finding the help, and maybe the consolation, he may seek.

The volume is a very large one: 1,650 pages of close print constitute a bulky handful; if a hint might be dropped to author or publisher it would be an advantage rather than otherwise were the ninth edition to appear in two volumes.

W. D.

An Introduction to Midwifery. ARCHIBALD DONALD. 8th edition. Publishers: Griffin. 6/-.

THIS little book, intended only for junior students and midwives, contains a large amount of useful information.

The importance of strict aseptic methods in midwifery cannot be too deeply impressed on the student. For this reason we would like to see the author recommending (1) the use of rubber gloves on *all* occasions; (2) the use of the stylet instead of the finger nail to rupture the membranes.

The "lubrication of the vaginal surface of the perineum with antiseptic lubricant" to minimise tears is a procedure open to criticism. It necessitates frequent insertion of the fingers into the vagina. It also renders possible the use of the contents of the "household vaseline jar" in the absence of the antiseptic lubricant.

Numerous illustrations appear throughout the book. Fig. 42 might be drawn more accurately in order to coincide with the method described in the text.

The chapters on anatomy and physiology should be appreciated by midwives who are usually ignorant of such subjects.

J. T. S.

Women as Army Surgeons. By FLORA MURRAY, C.B.E., M.D., D.P.H. Hodder and Stoughton, Ltd., London.

IF anyone finds the long evenings enforced by the Curfew weigh heavily upon them we advise them to pick up this book, and we guarantee they will not lay it down unfinished. In these days of slackness and world-weariness it brings a real breath of the vigour and keenness of the war. It is the

tale of a great adventure—simply and delightfully told. It is right that it should have been written, if only to put on record the fact that a handful of British medical women, unaided and often sorely hindered by the authorities, took a fully equipped hospital to the front and made a real success of it.

We will not spoil the reader's pleasure by quoting any of the interesting events here—they should be read with the rest and will move alternately to laughter and tears.

A small note of bitterness appears now and then which is rather to be deplored, but there is no doubt these ardent women had a hard battle to fight against prejudice and officialism. The book is written from the Suffragist standpoint, which accounts for it in some measure, and one of the most telling scenes which we cannot refrain from quoting is that when Dr. Garrett Anderson—the old fighter—receives congratulations on the passing of the Bill enfranchising women. The young orderlies were kind and a little patronising. “ ‘ Simply topping about your Bill,’ said the potential voters . . . personally quite untouched by their personal share in it.”

The book may be enjoyed by medical or lay reader, as it touches all aspects of the work, and its author is very much to be congratulated on the work of the hospital in Paris, at the front, and in Endell Street, and also on the interesting book about it which she has given to the public.

Manual of Medicine. By A. S. WOODWARK, F.R.C.P.
Oxford Medical Publications. 2nd edition, 1920. Pp.
xiii + 427.

AFTER a lapse of eight years Dr. Woodward has produced a second edition of his *Manual of Medicine*. As is to be expected, many alterations have been necessitated by the advances of medical science during that period.

The book is well arranged and should prove a popular text book for students as well as a book of reference for practitioners.

Nervous diseases, including a useful chapter on insanity,

so often neglected in similar publications, are well and clearly dealt with.

The section on diseases of Metabolism has been brought up to date in view of the great increase in our knowledge of this branch of medicine since the manual was first published.

Scattered through the volume are numerous useful formulæ.

The publication should be welcomed by those for whom the author intends it.

I. A. O'K.

Handbook for Tuberculosis Workers. By Noel Bardswell, M.V.O., M.D., F.R.C.P. Published by John Bale, Sons and Danielson, Ltd., London. 1/6 net.

A VERY useful little book, written in non-technical language, of a convenient size and suitable alike to the Tuberculosis officer and the voluntary worker.

Though naturally such large subjects as forms of Tuberculosis Disease, Treatment, Early Diagnosis, Milk, Disinfection, Prevention, Administration, After Care, The Colony, Open-air School, Financial Problems and the Training of Voluntary Workers are only briefly outlined, Dr. Bardswell is to be congratulated on getting a scientific exposition of the main points of the disease into such a limited space.

The booklet is brimful of suggestion for any thoughtful reader.

Diseases of the Eye. By M. S. Mayou, F.R.C.S. 3rd Edition. Henry Frowde, Hodder and Stoughton, London, 1920. Pp. xv. + 326.

A THIRD edition is in itself an indication of the popularity which this book enjoys.

We recommend it as an excellent adjunct to clinical lectures on the "Eyes," but as an elementary text-book *per se*, it is somewhat too obscure for the average student.

We think the first two chapters especially suffer in this respect. The former would be greatly improved by a brief reminder of the anatomy of the globe and its surroundings, while the latter on 'elementary optics and refraction' might readily contain fuller explanations.

The general get-up of the book is very good: we would especially like to commend the excellent micro-photographs.

The New Physiology in Surgical and General Practice. By A. Rendle Short, M.D., F.R.C.S. 4th Edition. Revised and enlarged. John Wright and Sons, Bristol, 1920. Pp. xi. + 291.

THIS useful summary of recent advances in physiology has been for the most part re-written. The chapter on vitamins is enlarged by references to diseases due to deficiency of fats, proteins and carbohydrates. The grouping of blood donors and the effects of splenectomy are considered. A new chapter on the heart has been added, and that on surgical shock has been thoroughly revised in the light of recent research. Keith's work on the sphincters of the gastrointestinal tract is briefly indicated.

We miss the chapter on acidosis and diabetes, though its substance is to some extent diffused through other parts of the book, and we should welcome a summary of the rapid advances in these subjects in a later edition.

The chapter dealing with the nervous system now includes new facts with regard to reflexes, the double motor path, the visual cortex, and the post-Rolandic area in relation to common sensation.

Chorio-epithelioma Malignum. By Arthur Sunde. 8vo. Emil Moestine Kristiana, 1920. Pp. 286.

In a lengthy illustrated monograph the author deals with this subject from all points of view. He has collected 38 cases of chorio-epithelioma and 240 vesicular moles; of these former 20 were inoperable when admitted to hospital, and 12 of the remaining 18 were cured, *i.e.*, 66 per cent. of cures. In 122

cases of mole which he was able to "follow up," chorio-epithelioma developed in 6, *i.e.*, 5 per cent. The nomenclature is discussed, and Sunde is very insistent that the disease should not be classed under carcinoma. The various theories are considered, especially with regard to the maternal or egg aetiology.

In the investigations 43.6 per cent. were found to proceed
from hydatidiform mole.

29.3 „ „ from abortions.

22.1 „ „ from normal pregnancy.

.5 „ „ from extrauterine pregnancy.

He lays stress on the fact that latency is sometimes marked in the disease. Vaginal hysterectomy is the operation of choice, especially as the regional glands are seldom affected, the metastases usually taking place first in the lungs.

Although it is proposed in the literature that a prophylactic hysterectomy should be done in all cases of vesicular mole the author considers this to be an evil practice.

B. S.

"*The Duodenal Tube and its Possibilities.*" By Max Einhorn. W. B. Saunders and Co., Philadelphia and London, 1920. Pp. 115. 13/- net.

EVER since Kussmaul's initial demonstration in 1867 of the possibilities of the stomach tube, it has been the desire of clinical physiologists to render the contents of the duodenum rich in biliary and pancreatic juices, similarly accessible to investigation. Undeterred by the failures of Boas, Hemmeter, Kuhn and others Einhorn has been patiently experimenting for nearly twenty years with duodenal tubes of various types. In this modest little book he recounts what degree of success has so far attended his efforts, and outlines many possibilities for the research worker and clinician of the future. The distance of the duodenal cavity from the mouth, the tortuous path to be traversed by any instrument intended to enter it, and the question of the permeability of the pyloric canal to solid objects, were the chief mechanical

difficulties to be overcome: several excellent reproductions of *x-ray* plates, showing the Einhorn tube actually in position in the duodenum, are sufficient evidence of the feasibility of access. By means of a heavy bead of glass or porcelain attached to a guiding thread, a tube, swallowed overnight by the patient may be demonstrated by *x-ray* to have passed the pylorus and to be resting in the duodenum next morning: by means of an aspirating pump attached, the duodenal content, uncontaminated by gastric juice, can be drawn off for biochemical investigation: this is the basic idea underlying Einhorn's researches. In three short, but clearly written chapters the difficulties of technique are explained and simplified: the diagnostic significance of the analysis of the duodenal content, and the possibilities of therapeutic direct duodenal lavage or alimentation are convincingly dealt with, within the limits of present-day knowledge. A host of inquiries and experiments still remain unsolved: suffice it for the present that within the scope of little more than a hundred pages, Dr. Einhorn relates his difficulties, and demonstrates the accessibility of the duodenum in the absence of organic pyloric stenosis, thereby opening up a wide field for clinical research of diagnostic and therapeutic importance.

Dr. Einhorn, having reached the duodenum *per vias naturales*, still possesses the explorer's desire to push on. Profiting by his duodenal experience, he has devised many formidable looking tubular apparatus for the like investigation of the lower reaches of the alimentary tract! The clinical use of these latter instruments is likely to be shunned for many a day by all save a few intrepid spirits consumed with an enthusiasm for exploration akin to his own.

W. D.

Aids to the Diagnosis and Treatment of Diseases of Children.

By John McCaw, M.D., R.U.I., L.R.C.P. Edin. 5th Edition. Pp. 404. London: Bailliere, Tindall and Cox, 1920.

A NEW edition of this useful little member of the "Students Aid Series" is welcome. It is essentially a students'

manual, and is a triumph in what can be accomplished in the way of *multum in parvo*.

It suffers, of course, from the defects of extreme condensation, not only in the small print and absence of plates or illustrations, but also in the effect on the reader. For instance, when thirteen possible causes of rickets are described in little over one small page we are left breathless, so to speak! It is astonishing, however, how much is included and how little left out, and the value of the book is further enhanced by references to literature on each subject.

Lectures on Diseases of Children. By Robert Hutchinson, M.D., F.R.C.P. 4th Edition. London: Edward Arnold, 1921. Pp. 416. Price 21/-.

WE welcome a new edition of this most valuable book. It is wonderful in the course of thirty-one lectures how much ground is covered and how few lacunae are to be found.

The book is written in the conversational style of lectures, and the customary paragraph headings are absent, but this in a way makes it pleasanter reading, and the graphic pictures impress the mind.

An extra chapter has been added in this edition on obscure fevers, and those on tuberculosis and syphilis written in the light of recent work. The section on infant feeding has also been slightly altered.

We can heartily recommend this book as delightful reading to any member of the profession.

A Short Practice of Midwifery. By Henry Jellet, M.D. 8th Edition. Publishers: Churchill. 18/-.

THE appearance of the 8th edition of this work is sufficient evidence of its well-deserved popularity, and further comment is needless.

The text has been revised and many new excellent illustra-

tions have been added, which will further enhance the usefulness of the book. Attention may be directed to the chapter on pubiotomy. Here the author recommends prophylactic pubiotomy, in suitable cases, about the middle of pregnancy. He describes a new modification in the technique of the operation, and gives special instructions concerning the after-treatment of the patient.

In future editions, some mention might be made of melaena neonatorum, a not uncommon and often fatal condition in infants.

The book, which is most admirably produced, can be recommended with the utmost confidence, as being one of the best on the market.

J. T. S.

Sexual Impotence. By VICTOR G. VECKI. Sixth edition. Saunders and Co. 1920.

THIRTY-TWO years ago Vecki wrote his well-known work on Sexual Impotence, and now the sixth edition is brought out by the author, a book of over 400 pages.

The general practitioner who, consulted by a man sexually impotent, seeks in this book to find the form of impotence, its cause, and the treatment, will probably be disappointed.

To the urologist the book has much of interest, and contains a very large number of useful references.

The author quotes numerous opinions that he either doubts the truth of, or disagrees with altogether; this is apt to leave a sense of uncertainty on the reader's mind, and it would have been better had Dr. Vecki expressed his own views alone, and in a more dogmatic manner.

Treatment is the weakest part of the book. The author hopes that Endocrinology may be of great use—perhaps it may. Methods of treatment for the relief of impotence that offer more hope of success than those at present employed are badly needed.

The book is well printed, written in an easy style, and contains a good index.

L. G. G.

Common Infections of the Kidneys. By FRANK KIDD.
Oxford University Press. 1920.

THIS book by Mr. Frank Kidd gives an admirable account of the signs and symptoms that the colon bacilli can give rise to when they infect the kidney, prostate, bladder, or testis.

That such infections are by no means uncommon, that when they do occur they are often either not recognised or treated incorrectly, makes the value of a work of this kind all the greater.

The style of the writing is good; the author has something to say, and says it in a clear and concise manner; his remarks are backed by a wealth of clinical material.

The book is fully illustrated with coloured plates, photographs of specimens and microphotographs, and is well worth its place on the bookshelf of every medical man.

L. G. G.

Nucleic Acids. By WALTER JONES, Ph.D. Monographs on Biochemistry. London: Longmans, Green and Co. 1920. Pp. 150+viii. Price 9/- net.

THIS is the second edition of Professor Walter Jones's authoritative work in Messrs. Longmans, Green and Company's well-known series. It has been brought up-to-date by the inclusion of the author's recent important work on the preparation of the nucleotides and their mode of linkage.

Work on the animal metabolism of the purines has accumulated of late and has led to the separation of man and the ape, who have not the power of converting uric acid into the more soluble allantoin, from the lower animals, who have this power. The subject of nucleic acids is, perhaps, in its present stage of more interest to the biochemist and the physiologist than to the medical practitioner, but there is every reason to hope that the work done on the conduct of these complicated groups will eventually clear

up the mystery which surrounds that aristocrat among diseases, gout.

Dr. Jones's book continues to be the standard work on the nucleic acids and can be strongly recommended as an excellent introduction, text book, and work of reference to an extremely important branch of biochemistry.

Everyday Mouth Hygiene. By JOSEPH HEAD, M.D.,
D.D.S. W. D. Saunders Co., London, 1920. Pp. 67.

THE author of this small book is to be congratulated on its production. It is well printed. The numerous illustrations are very clear, and the reading matter concise and to the point. The subject of mouth hygiene cannot be too frequently or too forcibly brought before the general public or the dental student, for, as the author points out in the opening chapter of the book, "infection of the teeth and gums cause directly, or indirectly, one half of the fatal diseases." We are very pleased to note that Mr. Head lays considerable stress on the importance of the use of dental silk in cleansing the approximal surfaces of the teeth and this with its directions and accompanying illustrations for the use of the silk will be found very useful. We are thoroughly in agreement with the author in his recommendation of the use of a small brush. The vast majority of brushes sold to the public are far too big, and do not give the proper amount of freedom necessary to reach all surfaces of the posterior teeth. We can heartily recommend this book to the dental student, the public in general, and more especially to those in the care of children, for whom we think the book was especially written.

W. S.

ABSTRACTS OF CURRENT LITERATURE.

SURGERY.

POTHERAT (Hôtel-Dieu, Paris) : *Survival of patients after amputation of the breast for cancer.* "Bull. de l'Acad. de Méd." 14 December, 1920. LXXXIV. 326.

Two common errors relative to this operation stand in need of correction, viz., that post-operative recurrence is so frequent, and that survival of life is so short, as to render the operation of little, if any, value. For many reasons, accurate statistics are almost impossible to obtain, but from a long experience, Potherat has collected a sufficient number of cases to show that patients can, and do, survive many years after operation, and even after secondary operations for local recurrence. He has selected for report only such cases in which the clinical diagnosis was confirmed by histological examination, and in which recurrence did take place. He relates the following cases:—

1. Patient died in 10th year from femoral metastasis: no local recurrence.
2. Recurrence of small nodule in scar during 9th year after operation.
3. Similar case, operated on 10 years previously by Lucas Championnière.
4. Recurrence of local nodules in 11th year after operation.
5. One patient, operated on 18 months after operation for recurrence in scar, died 19 years later, of cardiac disease, without further recurrence.
6. Another, who had been re-operated for recurrence in 17th month, is still alive and free from recurrence, 20 years after first operation.
7. A patient developed a spontaneous fracture of thigh, due to malignant disease, in 18th year after operation; she had never any local recurrence.
8. P. operated on a patient for a tumour (epithelioma) of left breast; 20 years previously, Michon, at the Pitié, had removed an adenofibroma from this breast, this patient lived, free from recurrence, for 24 years after P.'s operation; at the end of this time, two recurrent nodules appeared in the scar and were excised; she died 3 years later (47 years after her first operation, and 27 years after the cancer operation), of pleuropulmonary metastases.

Every operable recurrence should be excised; one patient of Potherat's had 6 such excisions in 14 years.

In general, we can anticipate a few complete and definite cures, and even in cases in which recurrence does take place, many patients have long and useful lives following re-operation: to the operation is directly attributable a definite prolongation of life.

WM. DOOLIN.

ISELIN (Basle): *Histological data in the prognosis of breast cancer.*

"Schweiz. Med. Wehchr." 1920. I.2. 22-26.

IT is admitted that the histological character of a breast cancer has a direct bearing on the operative prognosis. Hitherto, we have been accustomed to regard richly cellular cancers as of evil prognosis, while the more abundant the connective tissue elements, the less cheerless the outlook: thus, a scirrhus cancer should be the least unfavourable form, and medullary carcinoma the worst, according to the general conception.

Iselin's researches differ markedly from this opinion. Three prognostic types exist, according to his classification:—

- (a) Scirrhus, characterised by abundant connective tissue structure, with the cellular elements arranged in one or two layers.
- (b) Alveolar, with less connective tissue, and cellular layers three to five deep.
- (c) Medullary, with little or no connective tissue, and large masses of cancer cells throughout.

According to his figures, patients with scirrhus carcinoma mostly die within five years of operation; one-third of the alveolar type survive the five year limit, and two-thirds of the medullary group are found alive five years from operation. The scirrhus patients have a short survival period because they come to the surgeon at a much later stage of their malady than do the other types, when metastases have already taken place.

Iselin's contention is that the richer the cellular content of the tumour, and the bigger the cells, the better the prognosis. For the past 12 years, he has systematically employed radiotherapy after operation; he has also treated a number of inoperable cases with radiation, obtaining satisfactory results. Of patients treated systematically with x-rays between 1906-13, 39 per cent. were alive at the end of the three year period, and 30 per cent. at the end of five years, whilst, in non-radiated cases, only 17 per cent. reached the three year limit, and less than 12 per cent. reached five years.

WM. DOOLIN.

NEHER (Tübingen): *Results of treatment of breast cancer, before and since the introduction of prophylactic irradiation.* "Beiträge zur Klin. Chir." 1920. CXIX. 1. 127-151.

N.'s statistical results are as follows:—

- (1) Of 130 cases of breast cancer operated on in 1910-11-12, and who were not x-rayed after operation, he found 50 cases

- (38.5 per cent.) free from recurrence at the end of three years, and 36 cases (27.7 per cent.) at the end of five years.
- (2) Of 144 cases operated on in 1913-16, who *were* irradiated after operation, but with what to-day would be considered inefficient dosage, he found only 44 cases (30.5 per cent.) free from recurrence after 3 years, and only 12 cases (0.8 per cent.) at the end of 5 years.
 - (3) Of 72 cases operated on in 1916-18, and submitted to *intensive* irradiation afterwards, 41 per cent. showed recurrence within one year of operation: furthermore, these cases presented the highest proportion of internal metastases.

These very striking figures would rather tend to indicate that the utility of postoperative irradiation is not yet proven. It is eminently desirable that other clinics should publish their figures for purposes of comparison. (Pfahler's work from Philadelphia is in flat contradiction of Neher's conclusions. Postoperative irradiation is often carried out in German clinics by inexperienced hands, and doses which are either ill-regulated or insufficient might easily be injurious rather than otherwise.—W.D.)

Fietze, of Breslau, is of the same opinion as Neher, and, in a private communication, states he is "appalled" at the number of local recurrences observed in his cases since the introduction of *x-ray* treatment, whereas, prior to its use, local recurrences were much less frequent. Lohenhoffer ("Münch. Med. Wehschr." 1920. No. 5) is of similar opinion.

It is scarcely an exaggeration to say that, each time that one applies the *x-rays* to a surgical scar, one is carrying out an experiment on the patient, and that even to-day we do not know for certain if, when we advocate postoperative radiotherapy, we are rendering the patient a real service, or, on the contrary, are prejudicing her chances of cure.

WM. DOOLIN.

LENOM, W. S.: *Abscess of the Lung*. "Journ. Canadian Med. Assoc." December, 1920.

THIS paper is founded on work done at the Mayo Clinic. In 81 cases, pneumonia was responsible for 31, colds, influenza and other fevers 19, operations on the mouth (teeth extraction and tonsillectomy) 12, and abdominal operations 5. In two there was trauma, and in 12 the origin was unknown.

He points to the number of cases, over fourteen per cent., occurring after simple operations on the mouth with general anaesthesia. These cases are presumably due to aspiration pneumonia, and appear far too numerous.

It may be difficult to make a diagnosis in the early stages while the condition is obscured by the symptoms of the originating diseases, but in the later stages, irregular temperature with profuse

and possibly foetid expectoration should rouse suspicion, which may be confirmed by x-ray examination. It may be difficult to exclude bronchiectasis, except by the history. The abscess is most usually situated in the lower lobe, and an abscess in the upper lobe with insidious onset, even after repeated negative examinations for tubercle bacilli, may finally prove to be tuberculous, and should always be regarded with suspicion. It would appear from published results that the mortality in cases not operated on is 50 per cent., while in those submitted to operation it is only 25 per cent. Of the sixteen cases operated on in this series only three died.

In the same journal is another paper on the same subject by J. E. Lehmann. He also points to the frequency of abscess of the lung after operations on the mouth, and strongly urges the use of local anæsthetics in all cases. It would seem that general anæsthesia cannot be as carefully administered as in this country, where abscess of the lung is practically unknown after teeth extractions and tonsillectomy. He strongly recommends the use of the exploring needle for diagnostic purposes, and also as a guide in operation, for which purpose having located the abscess with the needle, he leaves the latter in position until the cavity is found at operation. He points out the frequency of irritable cough which commences a few days after the operation, and is usually followed by a fatal result. He explains this as follows:—when the chest is opened and a drain placed in the abscess, drainage is good, but where the abscess communicates with a bronchus, some of the contents reach the bronchus and set up irritation, this cannot be expelled by cough, which is practically futile, as the bronchus communicates through the drainage tube with the outside of the chest, so infective mucus accumulates and sets up a broncho-pneumonia. This difficulty may be overcome by making the drainage watertight and clamping the tube and allowing only intermittent drainage.

Many cases can be improved and some cured by the suspension method which procures better drainage. Extensive thoracoplastic operations followed by muscle, fat and skin transplants are often required.

R. A. STONEY.

GUDET: *A method of treating fractures of the femoral neck in old people.* "Bull. de l'Académie de Médecine." January 11, 1920.

THE author describes his method of treating fractures of the neck of the femur in old people by plaster.

It is founded on the method of reducing congenital dislocation of the hip by flexion to 90°, abduction, and pressure forwards behind the great trochanter; in this way the head of the bone is pressed against the acetabulum in dislocations and in fractures the neck is pushed towards the acetabulum, and, therefore, into apposition with the separated fragment. A thick plaster spica is then applied, to keep the fragments in position. A short anæsthesia may be required to allow of painless reduction of the fracture, but if this

is contra-indicated, a subcutaneous injection may be substituted. The advantages claimed are that it relieves pain, allows the patient to sit up in bed, or in a chair from an early stage; leads to consolidation in two to three months, and is followed by a minimum of shortening and rapid recovery of normal walking powers. Four cases are described in patients whose ages ranged from 57 to 81 years. Two were cases of oblique extracapsular fractures, the other two were intracapsular. In three there was no appreciable shortening after treatment; in the fourth case, which was not put in plaster till 8 days after the fracture, the final shortening was only 1 centimetre in place of the 5 which was present at the operation.

He claims that by this method an excellent result can be obtained, both anatomical and functional, in these cases which are admittedly difficult to treat with satisfaction.

R. A. STONEY.

LINSTET (Stockholm): *Etiology and pathology of Sciatica*. "Act. Med. Scand." 1920. LIII. 318-379.

DISSATISFIED with the prevailing explanations as to the true nature of this complaint, L. undertook a special detailed study of 100 consecutive cases of this condition in the Stockholm hospitals. As a result of his investigations, he has arrived at the conclusions. (1) that the pain of sciatica is to be regarded as a reflex or irradiation-pain induced by some source of peripheral irritation, (2) that this source of irritation, in the very great majority of cases may be found in some definite pathological alteration of structure in the neighbourhood or field of the sciatic nerve. Of the hundred patients who had sought relief in hospital from their "Sciatica," in all but nine was found a definite pathological lesion as a source of peripheral irritation. These lesions were grouped as follows:—

1. Tumours of spinal column and pelvis	...	3 cases
2. Vertebral deformities (scoliosis, etc)	...	8 "
3. Pelvic and intrapelvic lesions	...	3 "
4. Hip joint lesions	...	11 "
5. Fractured femur	...	2 "
6. Kneejoint lesions	...	14 "
7. High-grade genu varum and valgum	...	4 "
8. Genu recurvatum	...	4 "
9. Traumatic foot lesions	...	5 "
10. Severe flat foot	...	8 "
11. Talipes equinovarus	...	3 "
12. Polyarthritides (gon : rheum :)	...	12 "
13. Extensive varices	...	8 "
14. Other diseases (inf. paralysis, etc.)	...	6 "

91

15. Cases in which there was no lesion discoverable 9 "

91 per cent. of associated lesions is too high a percentage to be overlooked; it was further a remarkable observation, that where the lesion was one-sided, the sciatica was of one side, and of that side, only: whereas in the cases of "double" or "alternating" sciatica, the associated lesions were invariably bilateral. These lesions, then, must have at least some causal connection with the sciatic pain.

The actual connecting link, L. is at some pains to define exactly. In his conception, sciatica is a symptom complex rather than a disease per se, frequently difficult to define with marked accuracy and neuralgic rather than neuritic in type; the pain is functional in nature, rather than due to organic change in the nervous tissue itself, and largely originating in muscular over-exertion due to stress and strain caused by static disturbances.

WM. DOOLIN.

CAPLESKO (Bukharest): *Biliary symptoms due to latent appendicitis.*

"Bull. de l'Acad. de Médecine." January, 1921. LXXXI. 105. DIEULAFOY'S observations on the role played by the liver in acute appendicitis are now classical; this organ frequently suffers whether in an effort at elimination of toxins, or more directly due to a direct bacterial infection of the portal system. Multiple pyæmic liver abscesses secondary to appendicitis may be inoperable. Caplesco's observations lead him to the belief that a parallel series of liver injuries may be produced by a latent, and, therefore, unrecognised, appendicitis, patients presenting well marked hepatic symptoms without ever having had appendicular pain. In 17 individual cases, such an hepatic syndrome resisted the usual treatment, and disappeared only after appendicectomy. The general syndrome is one of irregular intermittent pain in the right subcostal region, occasional vomiting, with light icterus; in less than half the cases, rigors with fever ushered in each attack, which was accompanied by tenderness of the gall bladder and loss of weight. Operation reveals a pathological appendix, congested, perhaps containing coproliths, and usually with well defined mucosal ulcers. The hepatic symptoms, which disappear after removal of the diseased appendix, are to be regarded as secondary toxic manifestations.

WM. DOOLIN.

PAUL LECÈNE (Paris): *Endresults of operation for midgastric ulceration and hourglass stomach.* "Journal de Chirurgie." January, 1921. XVII. 1-8.

LECÈNE presents a detailed analysis of five patients operated on in 1910-14, and carefully followed up since; sufficient time has elapsed since operation to justify his presenting these as "endresults."

1° Female, operated in October, 1910, with a 15 years history of previous ulceration; double midgastric ulcer, with marked hourglass stenosis; pylorus patent; resection of midgastric segment, with restoration of stomach to normal form, but

smaller size. Last seen, in June, 1920, nearly 10 years after operation; reports that she can eat anything, and has never suffered from gastric symptoms since her operation.

2° Female, 42 years, operation January, 1913, 20 years ulcer-history; single ulcer and midgastric stenosis; wide segmental resection; uneventful convalescence. Seen in June, 1920, 7½ years after operation; eats freely and well; has put on weight; daily work in large factory.

3° Female, aged 45 years. Operated March, 1914. 30 years ulcer-history. Midgastric stenosis; typical midgastric resection; convalescence interrupted by a left-sided femoral thrombophlebitis. Last seen in June, 1920, 6¼ years after operation, has put on flesh, and has no digestive disturbance, although still particular as to what she eats.

4° Female, 51 years. Operation, June, 1914. 25 years ulcer-history. Bilocular stomach, solidly adherent to pancreas behind. Midgastric resection considered too dangerous; gastrogastrostomy (Finney type) carried out. Seen in June, 1920, 6 years after operation; has put on much flesh, and reports herself as "well," in spite of two subsequent attacks of pain, each of a week's duration, but unaccompanied by vomiting, and relieved by care in diet.

5° Female, 40 years. Operation, June, 1914. 4 years ulcer-history. Here also, owing to extreme pancreatic adhesion-formation, midgastric resection was deemed too venturesome, and recourse was had to the Finney gastrogastrostomy. Seen again in May, 1920, she reports that for 5½ years after operation, she had no trouble; in November, 1919, a slight hæmatemesis was corrected by careful dieting; radiography (December, 1919) demonstrates a stomach of normal shape and motility, with no trace of stenosis.

Lecène's conclusions, based on these five experiences, are as follows:—segmental resection of the ulcer-stenosis area is the operation of choice, for it removes the ulcer, and restores the stomach to its proper shape and function; where marked adhesion to the pancreas is present, it is too venturesome a procedure, and should be replaced by gastrogastrostomy; this has the disadvantage of leaving the ulcer in place, but corrects the gastric deformity; its endresults are slightly less good than those of the more radical operation.

Gastroenterostomy should be the advisable operation where the stenosis is at or near the pylorus, but for midgastric stenosis, it is an unphysiological procedure and does not give satisfying endresults; for this reason, Lecène has abandoned it for the relief of these cases since 1910. He asks for the publication of similar "endresults" from other clinics.

WM. DOOLIN.

MÉTRAUX, A.: *Late Results of simple Posterior Gastro-Enterostomy in Ulcers of the Stomach and Duodenum.* "Rev. Méd. de la Suisse Romande"

MÉTRAUX gives the results of an examination of the cases operated on by Prof. Roux in his public clinique at Lausanne. Three hundred cases were written to, and of these 210 gave detailed accounts of themselves, or were seen and examined by x-rays. In 112 cases the new opening was seen functioning under the screen. Cases are claimed as cures only when for many months or years they are fit for full work, and can eat ordinary food without unpleasant symptoms. In the cases stated to be improved are those who though they still complain of some symptoms like those present before the operation, yet find their life more comfortable than before. A table is given showing the position of the ulcer in the various cases, among the 210 were 69 classified as complicated, included in these latter are such conditions as callous, penetrating, ulcerating tumours, and perforated ulcers. The results are 90 per cent. cured, 6.6 per cent. moderate, and 3.3 per cent. died. The operative mortality was between 2 and 3 per cent. The operation performed for many years now by Prof. Roux is the no-loop posterior gastro-enterostomy; he has employed it almost exclusively since 1906, before that he frequently performed gastro-enterostomy *en Y*. He was led to give up this operation largely because he became convinced that the vicious circuit vomiting, so frequently seen in the earlier days of gastro-enterostomy, was due to obstruction and not to regurgitation of bile into the stomach. In fact he looks upon regurgitation of bile into the stomach as one of the greatest curative factors in this operation, as it neutralises the hyperacidity of the gastric juice, and he even goes further, and in certain cases where the pylorus is patent he makes only a very small gastro-enterostomy opening, merely to allow of this regurgitation and not with a view of drainage of the stomach.

With regard to the much vexed question of peptic ulcer following operation, it only occurred once in this series, and Prof. Roux considers that it is always due to faulty technique, or the use of a non-absorbable material for the inner suture. An analysis of the 112 cases examined under the screen showed that in 95 the new opening and the pylorus both functioned perfectly and simultaneously; in 15 cases the pylorus allowed a little of the barium meal to pass or was impermeable, and in two cases where the pylorus functioned perfectly, the anastomosis only allowed the passage of small quantities.

There were only five cases in which cancer developed from the ulcer.

This investigation was largely undertaken to refute the views of those who advise an annular resection for ulcers, and the author points out that with such excellent end-results, one would not be

justified in giving up simple gastro-enterostomy, an operation comparatively easy to perform, and with a very small mortality, for an operation admittedly much more difficult and involving a far greater risk. The only real advantage that can be urged for excision is the prevention of cancerous degeneration of the ulcer, and this risk is shown to be small, considerably smaller than the inevitable increase in the operation mortality.

We may conclude with the author that "Gastro-enterostomy practised by the great mass of surgeons—who, necessarily, are not all of the first rank—will give the best results for a long time yet to come."

Short notes on the 210 cases are appended.

R. A. STONEY.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF PATHOLOGY.

February 4, 1921.

Specimens from a case of Sudden Death due to Obstruction of the Coronary Artery, with a Psammoma of the Pia Mater from the same Case.

THE PRESIDENT (MR. T. T. O'FARRELL) gave an account of the case as follows:—The subject, a woman of about middle age, was brought in dead to hospital. At the post-mortem examination next day, she was seen to be well nourished. Post-mortem lividity was present, and there was marked cyanosis, particularly on the ears, lips and lower part of face. A few gas-containing bullæ were found under the skin of the abdomen and thighs. On removal of the calvarium the dura was found to be rather adherent to the under surface of the bone, particularly over the posterior part of the right frontal convolution near the middle line. When the dura was opened a firm tumour, the size of a small hen-egg, was found adherent to the pia mater. The surface was rather nodular, but apparently encapsulated. The brain substance was compressed, this was evident in the superior frontal convolution and extended into the

median fissure. There was evidence of arterio-sclerosis in many of the cerebral vessels.

Microscopically the tumour was very cellular, the cells more or less spindle shaped, and had oval or elongated nuclei. No mitoses could be found. In places the cells were arranged into whorls, some of which contained red-blood cells, and others almost completely calcified. The lungs were emphysematous; the right apex being slightly adherent to the thoracic wall.

The pericardium contained a small amount of fluid. The surface of the heart showed some fatty infiltration and the musculature was flabby. The mitral orifice admitted three and the tricuspid four fingers. The aorta was atheromatous, this condition being continued on to the heart valves. On dissecting out the descending anterior branch of the coronary artery, a marked patch of atheroma, a quarter of an inch in extent and beginning about three quarters of an inch from the origin of the artery, was found. The lumen of the artery, at this point, was considerably encroached upon, and a small elongated blood clot was found completely obliterating the lumen.

On cutting into the muscle wall of the heart, the part corresponding to the area of distribution of the occluded artery, showed many patches of fibrosis. It would appear that the coronary artery had been gradually encroached upon and then suddenly occluded by a local thrombosis. Microscopical sections taken through the fibrosed area showed patches of compact fibrous tissue which contained but few capillary blood-vessels. The patches were irregular in outline, and at their edges a few atrophic muscle fibres were included. In other places the normal striæ were well preserved, but many of the cells contained pigment. The pigment was collected in conical shaped deposits on each side of the nucleus, the bases of the cones being directed towards the nucleus. The pigment was of a yellowish brown colour, and failed to give the reaction for iron, and closely resembled the appearance of brown induration.

It was unfortunate that a full clinical history was not obtainable, but it was stated that the patient had been rather eccentric in her habits.

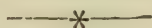
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VENTRICULOGRAPHY,

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VENTRICULOGRAPHY, or radiography of the ventricles of the brain, was first described by Dandy, of John Hopkin's Hospital, in July, 1918. The principle of the method is briefly as follows:—A needle is introduced into the lateral ventricle of the brain, as much cerebro-spinal fluid as will flow out is removed, and exactly the same amount of air injected. A series of X-ray plates is then taken with the head in different positions. The air in the ventricle shows up clearly in the X-ray plate in contrast to the dense calvarium, just as gas in the intestine, or air in the pleural cavity is obvious in the radiogram.

As the air assumes the highest level in the ventricles, the outline of one or of corresponding portions of both can be studied, according to the position of the head. Fig. 1 (p. 151) represents the effect when air has been substituted for the fluid contents of the left lateral ventricle; in (1) the left ventricle would show on the plate, in (2) the anterior horns, in (3) the right ventricle, in (4) the posterior horns.

Such a series of X-ray plates gives an accurate representation of the size and shape of the lateral ventricles.

If a tumour be present in a cerebral hemisphere it will, in all probability, modify the size or shape of the corresponding ventricle, and the site of the tumour will correspond to the deformity. It is hardly conceivable that a growth of any size would exist above the tentorium without affecting the ventricle to a greater or less degree. If, however, a tumour be situated below the tentorium cerebelli in the posterior cranial fossa, its pressure effects will be exerted primarily on the brain stem, and will cause obstruction to the outflow of cerebro-spinal fluid through the aqueduct of Sylvius and the fourth ventricle. Such obstruction will lead to symmetrical dilatation of the lateral ventricles or internal hydrocephalus, which is rendered obvious by the X-ray.

We have, therefore, a method by which we can absolutely determine:—1st, whether a tumour is situated above or below the tentorium cerebelli; and 2nd, if supra-tentorial, whether it be in the right or left hemisphere, and in which part of that hemisphere.

That there is need for such a method for the localisation of intracranial growths, all who have had any experience in neurology will acknowledge, for we have all seen cases in which it was impossible to determine not only the exact site of an intracranial tumour, but also whether it was above or below the tentorium cerebelli. Such patients are not given whatever chance an operation offers.

An exploratory craniectomy is in no way comparable to an exploratory laparotomy. The latter will reveal lesions anywhere in the abdomen, whereas the former brings to light only that portion of the brain in immediate relation to the opening. In many cases, moreover, a cortical tumour, or one lying but a few millimetres beneath the exposed cortex, escapes the most expert eye and the most refined palpation. After ventriculography one operates *knowing* that the tumour is below the bone flap, and though it may not be apparent at the first operation, it may become so later, so one is not tempted to such dangerous procedures as blindly puncturing or tentatively incising the cortex for



PLATE 1.
CASE I. Right Ventricle



PLATE 2.
CASE I. Left Ventricle. Note absence of posterior horn.



PLATE 3.

CASE II. The large clear area is due to the previous subtemporal decompression; the two smaller areas to air in the posterior part of the body and descending horn of the left ventricle. The anterior horn is occluded.

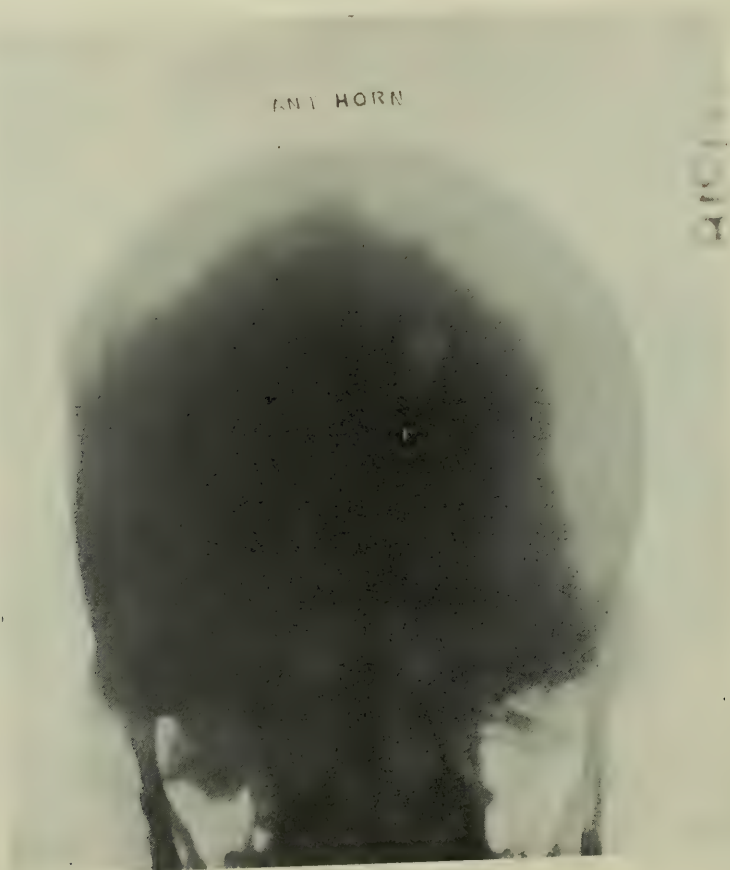


PLATE 4.

CASE II. Air in anterior horn of right ventricle, none in that of left side which was occluded by the tumour.

exploratory purposes, or to the not less dangerous practice of giving up the case, and letting the pathologist complete the operation in due season.

Mr. Henry and I have employed Dandy's technique in three cases. In each case we made a small opening in the skull under local anaesthesia, $1\frac{1}{4}$ in. above and $1\frac{1}{4}$ in. behind the external auditory meatus. Through this opening we introduced a needle in the direction of the tip of the opposite ear, *i.e.*, practically transversely and parallel to the coronal plane, to a depth of 5 cm. from the skin when it entered the trigone of the lateral ventricle. A 2 cc. syringe, with a three-way tap, was then fixed to the needle, and 2 ccs. of cerebro-spinal fluid withdrawn; the tap was turned, the syringe emptied, and filled with air, and 2 ccs. of air injected. More fluid was withdrawn, and more air injected, until fluid ceased to come. The patient's head was then rolled over towards the side of the needle in order to allow some fluid to pass from the opposite ventricle. In this way we succeeded in injecting varying amounts of air. The needle was withdrawn, and the patient removed to the X-ray room, where two lateral and two antero-posterior radiograms were taken.

Case 1. A man, 21 years of age, a patient of Dr. F. C. Purser's, with severe headache, occasional pain and stiffness in the back of his neck and shoulders, attacks of blindness, and double optic neuritis, no loss of muscular tone, no ataxia, no asynergia, no dysmetria, no vomiting.

Dr. Purser's diagnosis was an intracranial tumour, probably cerebellar.

As there was less risk in performing a ventricular puncture than in doing an occipital craniectomy, which might be unnecessary, we injected 40 ccs. of air into the right lateral ventricle after removing 40 ccs. of cerebro-spinal fluid. The figures show the result. Both ventricles were dilated to the same extent, indicating internal hydrocephalus. (Plate 1.) The posterior horn on the left side is occluded. (Plate 2.) The diagnosis was, therefore, a tumour in the posterior fossa of the skull; as occlusion of the posterior horn could not produce symmetrical dilatation of the ventricles, we concluded that a tumour was pushing

up the tentorium on that side, and thus pressing on the occipital lobe and occluding the posterior horn. The puncture relieved his headache, and he seemed perfectly undisturbed by it. This patient died suddenly in the ward some time afterwards, while awaiting operation.

The post-mortem examination revealed a tuberculoma, the size of a walnut, on the superior surface of the left lobe of the cerebellum, and adherent to the tentorium.

Case 2. Another patient of Dr. Purser's, male, aged 45, admitted semi-comatose, intense headache, aphasia, motor and sensory, paresis of right side. Diagnosis, left frontal tumour. We performed a sub-temporal decompression, which removed his headache, but had no other effect. A few days afterwards we punctured the left lateral ventricle. As only a few drops of fluid escaped, I concluded that that ventricle was small, and possibly distorted by the growth, so we punctured the opposite ventricle, withdrawing 18ccs. of fluid, and injecting the same amount of air.

The slides show:—That the left ventricle contains extremely little air, and that its anterior horn is occluded. (Plates 3 and 4.) The right does not show a clear outline, but it is clear enough to demonstrate that air can pass all through the ventricle on that side. (Plate 5.) These findings, taken with the clinical, confirmed the diagnosis of a tumour occluding the anterior horn and body of the left ventricle.

A craniectomy was done over the frontal lobe, but inspection and palpation did not reveal the growth. Considering that a subcortical growth might extrude when a cranial deficiency was left over it, I replaced the flap, hoping to open the wound again in the course of a few weeks. The operation made absolutely no difference in his condition, but he continued to get gradually weaker, and died a month later.

Post-mortem examination revealed a growth which *had* reached the surface just at the site of the bone-flap. It was a large infiltrating glioma, and inoperable.

Case 3. Girl, aged 23, patient of Dr. Cummins, intense headache, left hemianopia, double optic neuritis worse in left eye, and attacks of "blankness" ushered in with

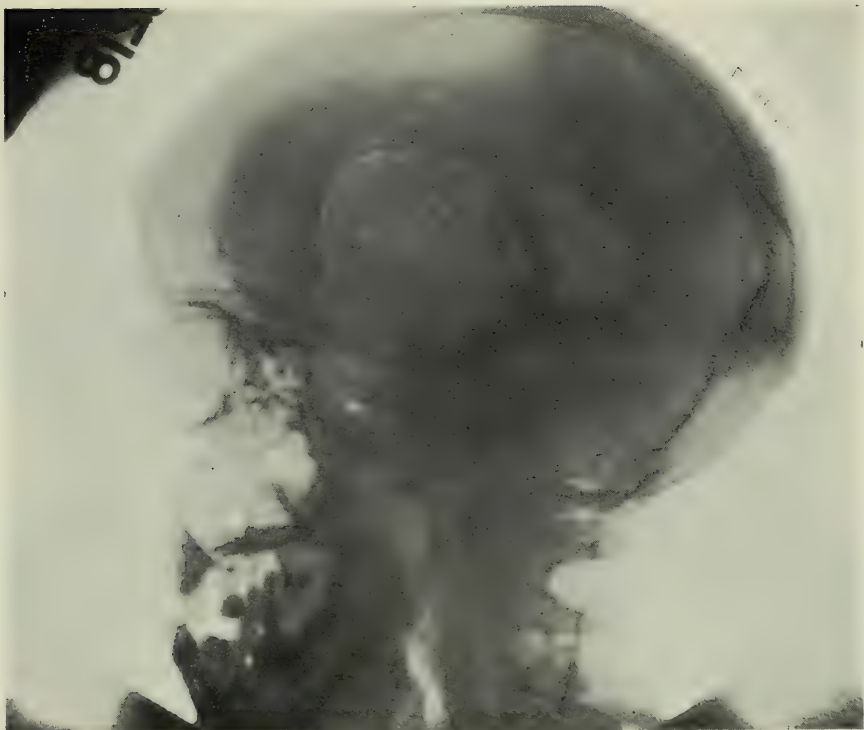


PLATE 5.

CASE II. Right ventricle. Shadows slightly accentuated as some detail was lost in reproduction. Shows that air passes freely throughout the ventricle.

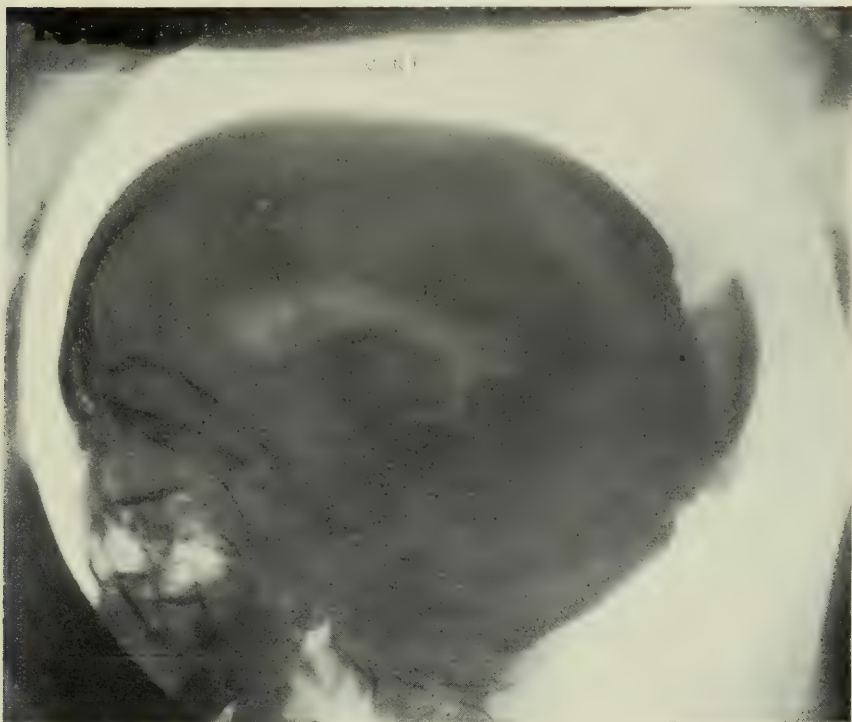


PLATE 6.

CASE III. Right ventricle showing occlusion of posterior and descending horns. Taken after exploratory craniectomy.

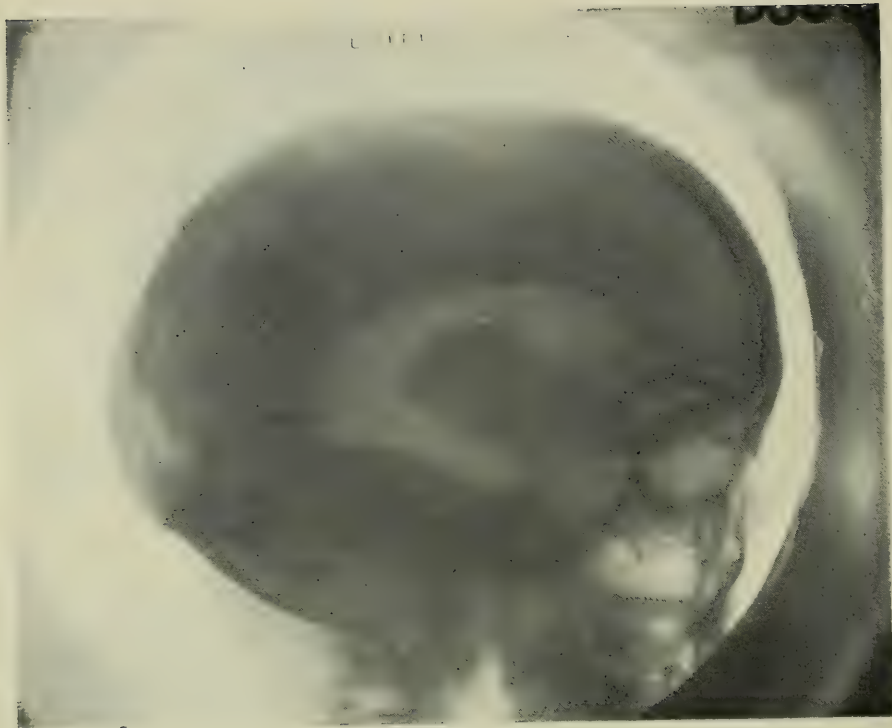


PLATE 7.

CASE III. Left ventricle. Slightly accentuated to restore detail.
Normal outline and size.



PLATE 8.

CASE III. Anterior horns of lateral ventricles.

circles of light before the left eye. She was not unconscious, nor did she fall or hurt herself during these attacks, which lasted but a few minutes. Vision getting rapidly worse. Diagnosis, tumour in right occipital lobe.

In order to confirm and, if possible, to get a more accurate localisation of the growth, I did a ventricular puncture on the left side, replacing 22ccs. of fluid with a similar amount of air. The X-ray plates met with an accident, and another series was taken next day. There was some difficulty in getting either ventricle completely outlined, but reading the plates in conjunction with the other signs, helped to confirm the diagnosis. She had her usual severe headache for twenty-four hours after the puncture, but since then she has not had a trace of headache. Ten days after the ventriculography I turned down a bone flap to expose the right occipital lobe. As there had been some delay in beginning the operation, the effects of the rectal anaesthesia began to wear off just after the osteoplastic resection had been completed. I, therefore, closed the wound. Two days afterwards I turned down the flap and thoroughly explored the occipital lobe on all its surfaces. No sign of a tumour was apparent, so I replaced the flap, and hoped for extrusion. I consider it safer to adopt this plan than to probe blindly into the brain substance. Three days after this operation I performed another ventricular puncture through the original opening. The pictures show that the posterior and descending horns of the right ventricle are occluded (Plate 6), which fact places the maximum growth about the trigonum ventriculi. The left ventricle was normal (Plate 7). I allowed three weeks to elapse before opening the wound again, in order to give time for any extrusion to take place. During this time the patient's general condition was excellent, and she was absolutely free from pain. The eyesight had been getting progressively worse since her admission to hospital, and by this time she was completely blind. The flap was again turned down, and the cortex exposed; during the separation of adhesions a considerable quantity of what I took to be cerebro-spinal fluid escaped. When the brain was exposed, one area of it, about an inch in diameter, flapped like a sail in

the wind. This I opened, and entered a cyst about the size of an orange, the outer wall of which consisted of the cortex, varying in thickness from a few millimetres at the site of incision to $\frac{1}{2}$ an inch at the anterior extremity. The cyst had a smooth lining, and extended from the middle of the occipital lobe to the post-central sulcus on the parietal lobe, and from the mesial border of the hemisphere above to the upper border of the temporal lobe below. The fluid which had escaped earlier in the operation had come from a puncture of the thinner portion of the cyst wall.

I removed its fluid contents and replaced the flap, leaving in some strands of silkworm gut for drainage, hoping that the cyst walls might collapse.

Shortly after the patient awoke she said her sight had come back, and that she could see her face in the mirror.

Fluid escaped for four days along the drainage material. The latter was then removed. Healing was uneventful, and no sign of re-distension of the cyst has been noticed since.

That this method is valuable is proved by the accurate localisation of the tumour in these cases; that it is simple, by the fact that it takes but a few minutes under local anaesthesia, and by the results obtained by us on the first cases in which we adopted it; that it is to all intents and purposes harmless, is shown by the fact that it did not influence the condition of the patients, for the ventricular puncture had nothing to do with the death of the first case, in whom a not unusual termination to growths in the posterior cranial fossa occurred. Dandy, in a report of seventy cases so injected, states that he had no fatalities, but that a few cases had shown signs of increased pressure after the puncture, rise of temperature, headache, and vomiting. None of my cases showed such symptoms. If they do occur, the ventricle is punctured again, and any excess of air removed. Even if this procedure were proved to have a mortality of its own, it can never be regarded as serious an operation as an exploratory craniectomy, than which it yields much more valuable information.

Something can be done for every intracranial tumour if the diagnosis is made early, as it can be by this method;

and if it is accessible it may be removed. If irremovable, pain and blindness may be postponed by palliative operations or by the insertion of radium. Brain operations are formidable in the eyes of the profession—largely because they are performed too late; yet the doctor who judges them by the results when extreme intracranial pressure is present, does not refuse to have his appendix out because the operative results in general peritonitis are bad. The essential thing for all to realise is that early diagnosis is the one hope, and extirpation the one cure.

In conclusion I must express my thanks to Dr. F. C. Purser, Dr. Cummins, and Dr. G. E. Nesbitt for sending the cases described in order that this method should be used to help in the diagnosis, and to Dr. T. Garratt Hardman, who produced most beautiful radiograms of the cases.

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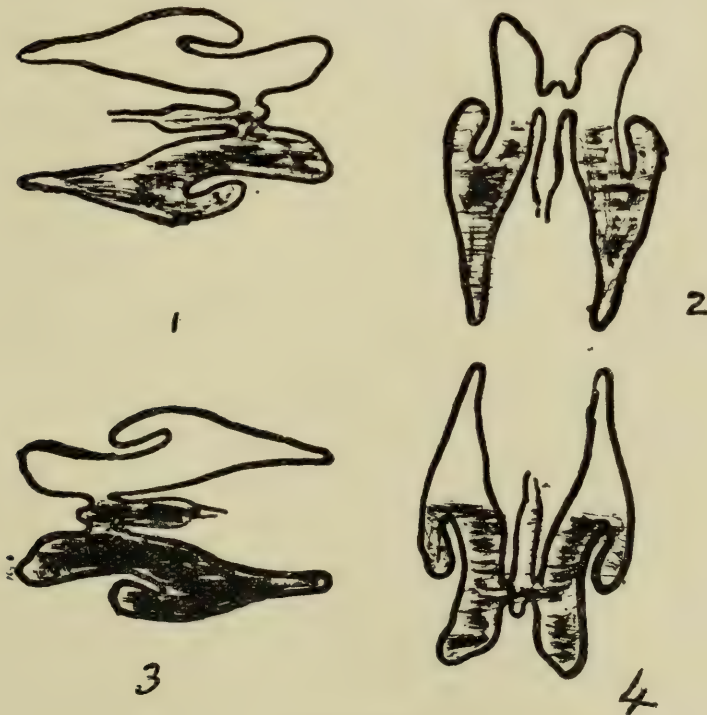


FIGURE 1.

SACRALISATION OF THE FIFTH LUMBAR VERTEBRA.

By MAURICE R. J. HAYES, F.R.C.S.I., Radiologist, Mater Misericordiæ Hospital, Dublin.

WHEN the body of the fifth lumbar vertebra is partially or completely fused with the sacrum, or when overgrowth of one or both of its transverse processes takes place to such an extent as to cause them to articulate with the iliac bones, the condition has been called sacralisation.

It is an abnormality well known to anatomists, but it is only in recent years that attention has been directed to it by Continental and American surgeons as a cause of obscure lumbo-sacral and sciatic pain.

In 1910, Adams (1) published the case of a girl aged 16 who had progressive lumbo-sacral scoliosis associated with pain referred to the sacro-iliac region. Radiography showed the transverse process of the 5th lumbar vertebra to be abnormally developed, and to articulate with the iliac bone. To this he attributed the symptoms which were relieved by resection of the transverse process.

Richards, Goldthwait and Clarke in America, Rossi and Bertholotti in Italy, Kleinschmidt in Germany, André Rendu, Arcelin, Nové Jossierand and others in France have published many cases. Here I might say that it was in very excellent papers by the latter which appeared in the *Lyon Médicale*, July, 1920, and *La Presse Médicale*, July, 1920 (for which I have to thank Mr. A. K. Henry), that I obtained most of my information on this interesting subject, and from which I intend largely to quote.

To regard the condition as a curiosity to be brushed aside as being of no practical importance can scarcely be argued from the attention which it has received from those whose names I have mentioned. Within the past few months I have seen four cases to which I shall refer in detail later on. Recently I accidentally picked up from amongst my old plates the negatives of two other cases, one of which I radio-

graphed in April, 1917, for caries of his 3rd and 4th lumbar vertebræ. This plate also showed a sacralised 5th lumbar, although I did not then recognise it as such. Early in 1918 a gentleman was referred to me for radiography of his urinary tract. I found a small calculus impacted in the lower end of his right ureter which was subsequently voided. He also had unilateral sacralisation on the right side, but he had no symptoms referable to it. I casually came across this negative quite recently also, and I have no doubt but a careful search through my old plates would reveal many other examples of this abnormality.

Unless it is that these unusual cases have come together in a bunch as we all know they sometimes have a peculiar habit of doing, it seems that the condition needs only to be better known to be more generally recognised.

Anatomical Considerations.

The spinal column is subject to many anatomical variations, and these anomalies are commonly found in the cervico-dorsal, dorso-lumbar, and lumbo-sacral regions. In the lumbar region six vertebræ are sometimes found; the transverse processes of the 1st lumbar are sometimes short, and have accessory ribs. This occurs when the transverse process of this vertebra is "associated with an independent costal centre, which may blend with it, or persist as a lumbar rib." (Cunningham's Anatomy.)

As regards individual vertebræ variations in the 5th are perhaps the commonest. The spines are often bifid; the neural arch may not have fused and there is spina bifida. The transverse processes may be elongated or bulbous at their extremities, and articulate with the ileum, or they may be fused with the sacrum.

Here it might be well to recall that the vertebræ are developed from three primary centres of ossification—viz.: one for the body and one for each lateral mass which includes the lamina and its processes.

The laminae unite during the first year. There are five secondary centres: one for each upper and lower surface of the body, one for the tip of each transverse process, and one for the tip of the spinous process. The 5th lumbar

vertebra, however, sometimes has five primary centres of ossification—viz.: one for the body, one for each side from which is developed the superior articular process, pedicle, and transverse process, and one on each side which subsequently form the inferior articular process, lamina and transverse process.

It is not surprising, then, that variations are found in this bone, the development of which is so complex.

Weidersheim, in *The Structure of Man*, says that fusion of the 5th lumbar vertebra with the sacrum is due to a tendency of the pelvic girdle and sacrum to shift farther forwards. He says:—"Although the pre-sacral portion of the column consists normally of twenty-four vertebræ, embryology and comparative anatomy show that this cannot be regarded as a primitive condition, and that the pelvis formerly lay much further back than at present, that is, that the trunk was originally longer than now.

"Rosenberg has demonstrated that in the course of human development the first sacral vertebra becomes incorporated in the sacrum later than the second, and that later than the third, and so on. And further, since the primary relationship between the vertebræ, which become the two anterior coccygeal of the adult, and the developing sacrum is discoverable, it is evident that while new sacral articulations are formed anteriorly, detachment of the vertebræ which were formerly sacral takes place posteriorly, the latter being transformed into coccygeal vertebræ. *A forward shifting of the sacrum and pelvic girdle is thus ontogenetically proved.*

"These changes come to an end when the twenty-fifth vertebra, by virtue of its apposition with the hip-girdle, becomes the first sacral and the promontory attains its full differentiation between it and the last lumbar vertebra—i.e., between the twenty-fourth and the twenty-fifth vertebræ of the whole column.

"This later assimilation anteriorly of the sacral vertebræ is further evident in the fact that synostosis between the separate parts of the sacrum always takes place from behind forwards.

"The tendency of the human pelvic girdle to extend even farther forwards is revealed in cases in which the last or

fifth lumbar vertebra enters into the constitution of the sacrum. The number of pre-sacral vertebræ is in such a backbone reduced to twenty-three, and this is the normal condition in the orang and chimpanzee, and the general, though not the invariable, condition in the gorilla. This change is accompanied in man by depression of the promontory which becomes duplicated. The sacrum appears deeply sunk into the pelvis; although such sinking may also occur without any incorporation of the fifth lumbar vertebra in the sacrum. In both cases the iliac crests rise almost to a level with the upper edge of the penultimate lumbar vertebra." (*The Structure of Man*. 1895. Pp. 33 and 34.)

Sacralisation may be uni- or bilateral, and it may exist to varying degrees on one or other side.

Rossi's statistics show

12 Bilateral symmetrical.

8 Unilateral, of which 5 were in the left, and 3 on the right side.

2 Combined with the spina bifida.

Nineteen radiograms collected by Nové Josserand and A. Rendu show

6 Bilateral symmetrical.

8 Bilateral asymmetrical.

5 Unilateral, of which 3 were on the right side and 2 on the left.

Six cases which I have seen show

3 Bilateral symmetrical.

1 Bilateral asymmetrical.

2 Unilateral, one on the right side and one on the left.

SYMPTOMS —Pain is the chief clinical manifestation, but it is not constant. Rossi admits that the deformity may remain latent indefinitely. It may be discovered accidentally in the course of examinations for trauma, rheumatism, or renal calculus. When it causes pain it is usually between the 20th and 30th year, although Adams, Nové Josserand, and Rendu record 2 cases at the age of 16. Bertholotti holds that there is a relation between the onset of the first symptoms (pain) and the completion of the processes of ossification. The symptoms vary. Sometimes pain is continuous, and increased by exercise. Sometimes there may

be acute attacks of neuralgic pain at intervals of days or weeks, or the pain may come on so intensely and so suddenly that the patient is unable to move.

The site of the pain is also variable, but it is usually in the lumbar region, and towards the base of the sacrum. It is median when the abnormality is symmetrical, and to one or other side when it is unilateral. It is then located in the region of the sacro-iliac articulation, and usually on the same side as the abnormality, although it may exceptionally be on the opposite side. The pain may radiate along the sciatic nerve towards the ischium or coccyx, or into the groin. One case is mentioned in which there was a patch of hyperesthesia so intense as to prevent the patient sitting comfortably for any great length of time.

Bertholotti and Rossi lay stress on the nervous lesions which accompany these neuralgias, such as flaccidity of the muscles, zones of hyperesthesia, diminution of tendon reflexes, diminished response to electrical stimulation, and even reaction of degeneration in certain groups of muscles, particularly the flexors. After minute examination from this point of view, Nové Jossier and Rendu have been unable to confirm these observations, but they suggest as a possible explanation that these cases were more or less severe. They have, however, observed in one or two of their cases a functional derangement for which they have been unable to find a satisfactory explanation—namely, inability to flex the knee beyond a right angle without causing pain, for, they say, there is nothing in the joint capable of causing this limitation of movement. The pain referred to the groin is deep-seated, and is localised principally towards the lower end of the ureter, and is increased by pressure.

On examination one finds the site to which the pain is referred more or less extensive, and there is pain on deep pressure. Flexion and lateral inclination of the spine are painful.

In bilateral sacralisation there is flattening in the lumbar region with obliteration of the normal lordosis. This region seems to be shortened, elevated, and the transverse dimensions of the sacrum appear to be increased.

In unilateral sacralisation there is frequently a lumbar scoliosis and appreciable asymmetry of the sacro-iliac region. Sometimes even one side of the pelvis is more elevated than the other, and there is slight lameness.

DIAGNOSIS.—From what has been already said it is not very difficult to recognise the condition, and radiography will show the abnormal development of the transverse processes of the 5th lumbar.

It is, however, very difficult to establish the relationship which exists between the abnormality, and the symptoms complained of by the patient. The latter are common to many and varied affections of the region, *e.g.*, sacro-iliac disease, caries of the lumbar vertebræ, osteo-arthritis of the vertebræ, renal calculus, etc., any of which may exist with latent sacralisation. One of my cases had caries of the 3rd and 4th lumbar vertebræ, one had superficial erosion of the sacrum, and one had symptoms suggesting renal calculus, and one actually had a calculus impacted in the lower end of the ureter. In the matter of differential diagnosis I will quote verbatim what Nové Jossérand and Rendu say.

“ In the present state of our knowledge to elucidate the problem one may be influenced by the following facts:—

“ (1) The similarity between the symptoms of sacralisation and the affections named is vague and remote, and it is still less on thorough examination because the definite diagnostic signs are wanting. Thus in many cases where local and referred pain point to sacro-iliac disease, pain is not caused by separating or compressing the iliac bones which characterises inflammation of the sacro-iliac syncondrosis.

“ Similarly in Pott's caries. Sacralisation produces rigidity and pain on movement, but this pain is not confined to the body of a single vertebra. There is no projection of the spinous processes and the rigidity is less than in lumbar caries, and the lateral movements and rotation are more limited than flexion and hyper-extension, contrary to what is observed in tuberculosis of the spine. The referred pains of sacralisation appear to be indefinitely localised, and the symptoms less accentuated than in nerve lesions.

“ Finally when the symptoms suggest an affection of the

kidney or appendix the clinical examination and radiography fail to show any physical signs relating to them.

“(2) The mode of onset and subsequent development of pains caused by sacralisation are sufficiently characteristic.

“A healthy young person begins to complain without any apparent cause. The pain persists or returns sometimes at prolonged intervals without any interference with the general health, and without any indication of new signs of a spinal or nervous lesion. These points are strong, presumptive evidence of sacralisation. It is well to note that sacralisation might become evident only after trauma or an attack of rheumatism. The diagnosis then becomes much more difficult. The association of the site of pain with that of sacralisation is an additional fact not without value. We have observed the pain always on the side of the malformation when it is unilateral or predominant on one side, and when the deformity is generally symmetrical, then it is bilateral. The lumbar pain is located most frequently on the affected side; nevertheless, it is well to remember, as Richards points out, that it may be on the opposite side.

“(4) Richards insists strongly on the necessity for searching carefully for the points of bony contact by making many radiographs at different angles. His advice ought to be followed, and there is no doubt that the existence of bony contact supports a diagnosis of sacralisation.

“At the same time it must be noted from cases so far published that bony contact is not an essential condition, and that one ought not to try to establish a constant ratio between the degree of bony deformity and the intensity of the symptoms.

“When all these factors agree the diagnosis of sacralisation ought to be placed on a firm foundation. On the other hand, it would be prudent to keep the patient under observation for a certain time before making a final diagnosis, and even then there may be some reservation. But it may be hoped that with greater experience of the condition there shall be more definite signs of recognising it.”

Of the six cases which I have mentioned, in two only were the symptoms definitely referable to the abnormality, and they could be explained on no other hypothesis. One was

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PLATE 9.



PLATE 10.

Normal fifth lumbar vertebra. Compare with Plates 9 and 11.



PLATE II.

a robust man, aged 47, who led an active life in the country; he took much exercise, and he was fond of riding and shooting. His symptoms developed gradually, and there was no history of injury. He had pain over the left sacro-iliac region on standing and also when sitting in certain positions. He had no pain when walking, and he had no pain when he was partly standing and partly sitting on a high seat.

His malady was variously diagnosed as rheumatism, lumbago, sciatica, and sacro-iliac disease, and in order to establish this latter diagnosis he was referred to me for *x-ray* examination. This showed an abnormally-developed transverse process of the fifth lumbar vertebra on the left side which was articulating with the iliac bone (*see* Plate 9).

The patient I have shown here to-night is under the care of Mr. Barniville at the Mater Misericordiæ Hospital, to whom I am indebted for the privilege of exhibiting her. She is a school-girl aged 13. Her parents are alive and in good health, and she has several healthy brothers and sisters. She has had no previous illness. About a year ago she had influenza, after which she had pain in the lower part of the back and in the legs on walking. She also noticed that she walked peculiarly. She is now fairly well nourished, but thin. She walks with the knee-joints slightly flexed, and the thighs slightly abducted. She refers pain mainly to the outer surface of the thighs, and she says it is slight in the lumbar region. Her fifth lumbar spine is prominent. There is no tenderness of the spine or sacro-iliac joints.

Flexion, lateral flexion, and rotation of the spine are limited. The lower lumbar spine is rigid. Her knee jerks are somewhat exaggerated. Complete extension of the knee joints can be produced passively, but it causes pain in the hamstrings to do so.

X-ray examination shews bilateral symmetrical sacralisation of the fifth lumbar vertebra, the spine of which is tilted upwards, and it lies close to the spine of the fourth lumbar vertebra. There are no signs of caries of any of the vertebræ (*see* Plate 11).

TREATMENT.—Two methods of treatment have been practised: radical and palliative.

The results of radical treatment (excision of the offending

transverse process) have been uncertain—no case of complete cure has been reported.

Palliative Treatment.—Rest, the application of continuous currents, *x*-rays, and other physical therapeutic methods have given relief in the experience of many.

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AN OPERATION FOR THE TREATMENT OF FREQUENT LUXATION OF THE SHOULDER JOINT.

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THE operation described below was suggested to, and successfully and effectively performed on several occasions by, my friend, Mr. J. E. Lehman, Consulting Surgeon to the Infirmary at Winnipeg.

The patient is placed in the prone posture on the operating table. A straight incision, about three or four inches long, is made through the integuments of the back, three fingers' width above the lower border of the posterior fold of the axilla, and parallel to it; the lips of the incision are retracted, and the *teres major* muscle and the long or scapular head of the *triceps* defined.

The upper limb is now flexed at the elbow joint, and the forearm drawn towards the middle line of the back, and the head of the humerus strongly rotated medialwards (backwards). (Plate 12.)

The part of the humerus which lies immediately behind the insertion of the *teres major* is exposed, and a hole, with a diameter of about three millimetres, is drilled horizontally through it by means of an Archimedian drill near the upper border of the *teres major* muscle; while the bone is being drilled, the finger of the assistant should guard the point of exit. Similarly a hole is drilled through the axillary border of the scapula, immediately above the origin of the *teres major*. A crochet hook is passed through each of the holes in turn. A fine silk suture, threaded through the eye of an aneurism needle, is held tightly across the bend of the needle, and, guided by the forefinger, is made to engage the barb of the crochet hook; the latter is then withdrawn, and carries the fine suture with it through the hole in the bone; a very stout cord of silk is now threaded through the loop of the fine suture, and by means of it drawn through the hole in each of the bones in turn, the

cord must be brought across on the deep or anterior surface of the scapular head of the triceps muscle.

The upper limb is now straightened out and abducted until it forms with the body an angle of about seventy-five degrees; the cord is pulled taut and firmly tied, and the incision closed.

The arm is bound to the side until the wound heals. When this happens, the patient may be discharged, with the caution not to submit the arm to unnecessarily undue strain.



PLATE 12.

In the illustration the crochet hook has been passed through the hole in the humerus, and engages the suture drawn across the aneurism needle.

The thick stout cord with which the bones are to be tied together has been drawn through the hole in the scapula by means of the fine suture.



PLATE 13.

A NEW METHOD IN PITUITARY SURGERY.

BY ARNOLD K. HENRY.

THE pituitary gland occupies a more impregnable position than most of the structures attacked by surgeons. Like other impregnable positions, it has been taken repeatedly; but it has not been taken easily. The fossa in which it lies is invested above by the optic chiasma, on either side by the cavernous sinus surrounding the internal carotid artery and including the 3rd, 4th, 6th, and parts of the 5th cranial nerves. Behind it is the brain stem.

No method of approach has yet been described which is at once safe, and accurately controlled, but many methods of reaching the gland have been devised. Three must be considered.

1. *The orbito-frontal route* of McArthur and Frazier, which has been used over thirty times.
2. *The fronto-temporal route*, first suggested by Krause, and used by Heuer and Adson.
3. *The transphenoidal route*, with submucous resection of the nasal septum, perfected by Cushing.

By all these methods the surgeon relies upon direct vision, and what he sees lies at the bottom of a deep recess. He has no accurate means of controlling the exact position of the end of his instrument in a distant and perilous field; the mental strain in consequence is not easy to exaggerate.

Frazier's orbito-frontal route involves turning down an osteo-plastic flap of the frontal bone, removing the roof of the orbit, and retracting the orbital contents downwards, and the frontal lobe upwards. Division of the dura gives the operator access to the tumour, which is still screened from him at the apex of the deep recess by the optic nerve and the carotid artery.

In the fronto-temporal approach used by Adson, an osteo-plastic flap is made in the temporal fossa, the dura is opened, and the frontal lobe raised. The edge of the lesser

wing of the sphenoid is used as a guide to the optic nerve, and thus to the pituitary tumour.

With Cushing's transphenoidal approach by the nasal route, the surgeon is working at the bottom of a long, narrow tunnel, which he must keep illuminated.

He first resects the septum submucously, up to the sphenoidal sinus; so far, so good. He is now faced with the problem of the sphenoidal sinus. This sinus may be absent, for the sphenoidal body may be solid; and the surgeon is then without a guide to the position of the pituitary fossa, which normally bulges into the sinus.

Again, the sinus may be divided by a septum into anterior and posterior compartments, and he may mistake this septum for the pituitary floor. Or yet again, the sinus may extend so far backwards, beneath the pituitary fossa, that it may lead the operator to attack the floor of the posterior cranial fossa, and so to endanger the brain stem. The penalties for deviation from the middle line in this route are formidable.

The Choice of Route.

With regard to the choice of route, it is significant that Cushing, whose operations upon the pituitary outnumber the aggregate of those performed by all other surgeons who have ever attacked this region, should have performed the great majority of his operations by the nasal route. Up to 1916 he had used it 106 times. In his Wier Mitchell lecture for 1914, Cushing states that "the cases for which a frontal operation is indicated cannot compare, either in number, or on the ground of risk, or of promised improvement, with those in which a transphenoidal operation is suitable."

Much, however, has been written in disparagement of the transphenoidal approach, for many pituitary tumours spread upwards, and it is claimed that only a partial removal of these can be effected by the transphenoidal method.

It is instructive, however, to analyse some of the results obtained by the intradural methods of approach. In a recent paper advocating the orbito-frontal route, three successes are recorded. In one case, a cyst was punctured with temporary relief; in the second, a fragment only of the tumour was removed, with relief of headache, but with

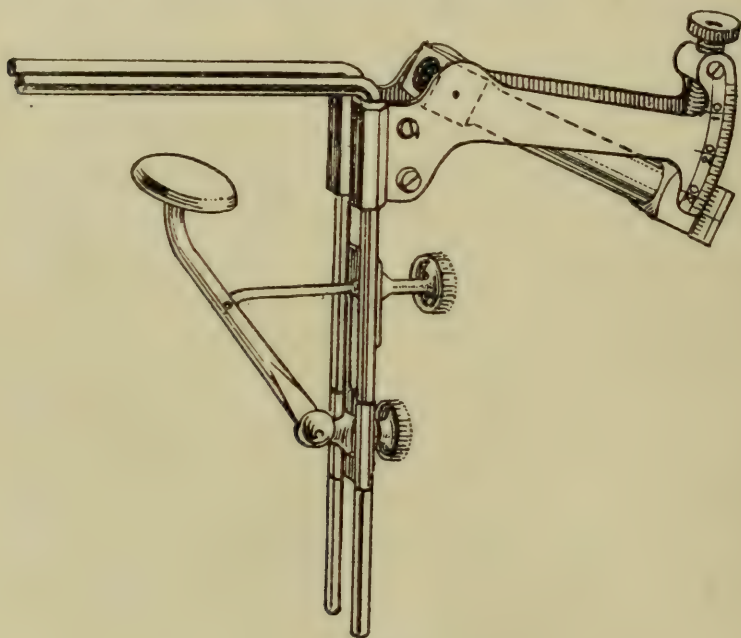
no improvement of vision; and in the third, no tumour was found to remove.

Mr. Adams, A. McConnell and I, using the illuminated retractors devised by Frazier, have recently tried upon the cadaver all the intradural routes which have been described. We have been struck by the inaccurate conception which published illustrations of these routes give of the depth and limitations of the operative field. An upward extension of the tumour, far from simplifying the intradural operation, tends rather to add to its difficulties; for as it rises out of the pituitary fossa, the tumour carries up with it the circle of Willis and the optic nerves, and it must then be attacked through gaps in this neurovascular rampart.

Adson has certainly achieved three very brilliant successes by the intradural route; but it is to be noted that, while in his series of six cases, the tumour was completely removed in four, one of these died; in two other cases the tumour was only partly removed, in one case with improvement of vision, and in the other with no benefit other than relief of headache, which Adson frankly ascribes to the cranial decompression. The fatality in the series was due to cerebral œdema, and the tumour in this case, to judge from the illustration, would have been far more safely accessible by the transphenoidal route. The anatomy of the region, and Cushing's very definite statements on the subject, lead me to believe that *complete* removal of a pituitary tumour by the intradural routes must be an exceptional possibility. Excellent results, both in respect of vision, relief of pressure, headache, and dyspituitarism, have attended a partial resection of the gland, and these facts, taken in conjunction with the difficulty and danger of the intradural approaches, even in the hands of specialists in cranial surgery, tend to emphasise the possibilities of the transphenoidal route.

I have already alluded to the difficulties and dangers which attend its use. If it is to command a wider confidence than it has yet attained, if it is to become as safe in the hands of the general surgeon, as in the hands of Cushing, these difficulties and dangers must be eliminated. Their elimination, as I shall presently show, can be largely effected by the use of radiography, and of a special instrument (Fig. 1).

Radiography, of course, plays an indispensable part in pituitary surgery. It is essential, not only for diagnosis, but, if the transphenoidal route is contemplated, it gives invaluable information with regard to the variable relations of the pituitary fossa and the sphenoidal sinus. It can, however, do much more than this. It can, by the use of the instrument which I have devised, guide the surgeon infallibly to the pituitary fossa. The method occurred to me in August last, after reading that de Martel had, before operation, had the pituitary fossa localised, as if it were a projectile. His method, however, was not further described, and, unfortunately, the beautiful procedure perfected by the French,

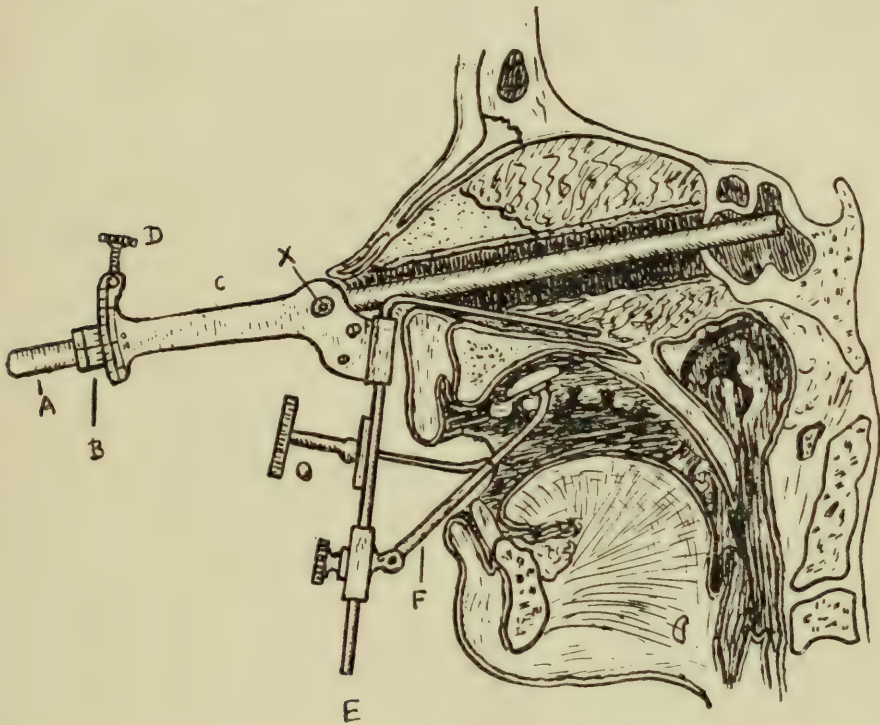


(FIG. 1.)

of direct radiosopic control during the actual operation of removing a projectile; is not available for removing the pituitary; the definition of the fossa and the sphenoidal sinus upon the fluorescent screen is far too vague to give the operator much aid or security. It appeared to me then, that as continuous radiosopic control was out of the question, an instrument could be devised which would admit of sufficient intermittent control, by the taking of successive radiographic negatives, to give an accurate means of access to the gland. By its aid capillary tubes containing radium emanation can be inserted directly into the tumour itself,

or, if desired, the fossa may be evacuated by a special auger-bit described below. Briefly, any manipulation is available which can be carried out through a tube, and instruments resembling those designed for use with the urethroscope, or cystoscope, may be employed for this purpose.

The two chief requirements of the instrument are: first, absolute stability; and secondly, the median position must be exact—the long axis of the instrument must be accurately in the saggital plane.



(FIG. 2.)

The mucous membrane is removed from the left side of the septum to show the part resected and the trephine in position.

A, Graduated handle of trephine projecting from the square end of the tube B, which carries a vernier. This travels on the scale marked in degrees on the plate C. The tube B is pivoted at X between this plate and its fellow. D, Screw for regulating the inclination of tube B. E, one of the two bars which enter the nasal fossae. These bars support F, the intra-buccal rod and cap. By turning the screw O, the instrument is stabilised.

The instrument (Fig. 2) consists of the following parts:—Two intranasal bars, which lie on either side of the nasal septum. These bars bend vertically downwards in front of the upper lip and support a pivoted rod with a terminal cap

which enters the mouth. This cap presses against the hard palate, when a screw approximates the rod to the vertical bars.¹ This part of the instrument is vital to its success, for upon it depends its capacity of maintaining an absolutely fixed position, and I am indebted for this simple and effective device to my wife, Dr. Milne Henry. To the vertical rods are attached two plates, between which is pivoted a tube, which can be inclined at an angle to the horizontal by means of a screw. The squared end of this tube carries a vernier, which moves over a scale attached to the plates and enables the inclination of the tube to be accurately adjusted to one-quarter of a degree. After the nasal septum has been resected submucously to afford a path to the face of the sphenoidal sinus, the instrument is fixed in position with its long axis in the sagittal plane. This position of the axis is verified by an antero-posterior radiogram, taken by a method for which I am indebted to Dr. T. Garrett Hardman. A drawing-pin is fixed in the skin over the nasion and another over the inion: the patient's head is moved until the shadows of the pins are concentric, and the radiogram is taken with the head in this position. If the long axis of the instrument is in the sagittal plane it will point to the fused shadow of the pins.

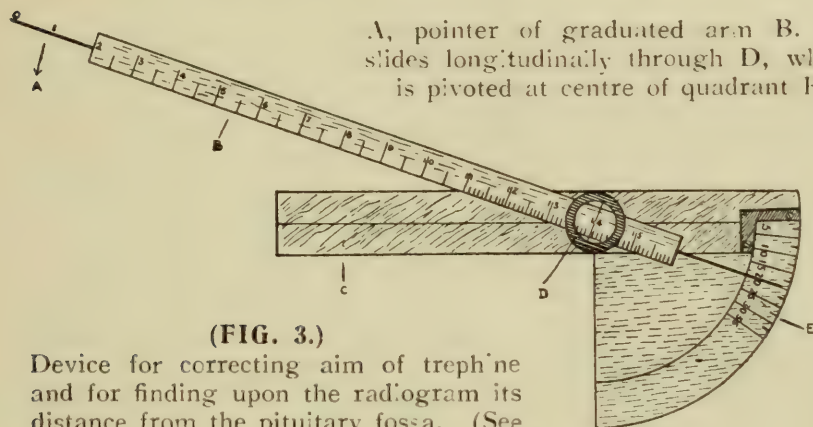
A special trephine is then introduced, which has the property of evacuating what it cuts; it is made like an auger-bit on the principle of the Archimedian drill. Professor Evatt called my attention to this, and I wish to thank him for solving in an instant a problem which had been exercising me for some time.² The approximate inclination of the tube needed to aim at the floor of the pituitary fossa through the sphenoidal sinus is determined by a preliminary radiogram, taken at any time before the operation with the instrument in position. When the trephine has

¹ A pad adapted to the palate protects it from contact with the metal cap. The nasal prongs may be covered with rubber tubing.

² All the instruments used through the inclined tube are finely-graduated so that the exact distance from their extremity to the point at which the tube is pivoted can be read at a glance upon their handles. An adjustable collar allows each instrument to be introduced precisely as far as is required and no further.

been passed up to the face of the sphenoidal sinus, its direction is verified by another radiogram, taken in profile (*see* Plate 13), after securing the horizontal position of the head by screening it (as Dr. Hardman suggested) with a lead pellet in each auditory meatus and making the two shadows fuse. (The pellets and pins may be so chosen that their shadows, when superposed, not only are concentric, but coincide.) If the inclination of the tube is incorrect, it can be easily and rapidly rectified by means of the device shown in Fig. 3.

The two arms, B and C, are set at the angle recorded on the scale of the instrument. The graduated arm B is advanced beyond the pivot D to a distance equal to that



of the point of the trephine from the pivot of the tube. The arm B is then laid upon the negative of the profile radiogram so that its point and long axis coincide on the plate with corresponding parts of the trephine's shadow. The arm C is held fixed by the observer, and the inclination of the graduated arm B is altered until its point A, when advanced, will strike the outline of the pituitary floor upon the negative. The correct angle of inclination and the distance through which the trephine must be advanced can thus be found by two simple movements.

The correspondence between the measurements on the plate and the actual distance of the trephine from the pituitary floor is very close at the centre of the field. Thus with the x-ray apparatus used in this work, and with

heads of average transverse diameter, I found that 11 millimetres on the negative corresponded to an actual distance of 10 millimetres.

The sphenoidal sinus is then penetrated, and the trephine advanced through the required distance, which has been determined by the radiogram, to the floor of the fossa. Its position here can once more be verified, by a third radiogram.

The fossa is then penetrated, and may be evacuated by the trephine; or the tumour may be treated by the high-frequency current, or by implanting radium.

Recent work by Frazier, and others, on the treatment of brain tumours, indicates that radium implantation may, become the method of choice.

The Operation.

With regard to the actual technique of operation the following steps may be described:—

1. The operation is performed in the *x*-ray room. A preliminary radiograph, with the instrument in position, may, with advantage, be taken several days before the operation. This can be done, using cocaine to anæsthetise the nasal floor and the palate. This radiogram will give indications of the approximate elevation required, and the distance from the pivot of the tube to the sphenoidal sinus and the pituitary floor.

2. Preparation of the patient.—Urotropin should be administered for four days previous to operation. Atropin should be given just before operation to prevent the undue slowing of the heart, which has been described as following stimulation of the pituitary. Mercurochrome may be used to sterilise the site of incision in the nasal mucosa. In his series of operations, Cushing had only four cases of sepsis. Mercurochrome should diminish this risk, which is already practically eliminated by the fact that contact with skin and the mucous surface of the nasal fossa may be avoided by working through the tube of the instrument.

3. Anæsthesia.—Novocain and adrenalin may be used for the nasal cavity and palate, combined with rectal ether, given by Dr. Alfred Boyd's safe modification of Gwathmey's method.

4. This allows the patient to be placed in the seated posture with the head thrown back and supported.

5. Submucous resection of the septum.

6. The instrument is adjusted in the nose and mouth as in Fig 2, and its tube is aimed at the pituitary through the sphenoidal sinus. The approximate inclination has been estimated from the preliminary radiograph.

I have already described the remaining stages of the operation, which include verification of the position of the trephine by antero-posterior and profile views, which enable the pituitary fossa to be penetrated with precision in the middle line.

The advantages of the method may be summarised as follows:—

1. It reduces to a minimum the risk of the transphenoidal approach by giving it mathematical precision.

2. It avoids the retraction required to obtain direct vision, and so increases the immunity from sepsis which is secured by the submucous route.

3. As much can be safely accomplished by its use as can generally be achieved by other methods formidable in comparison.

I hope, with Mr. Stafford Johnson, to work out the applications of my instrument to the surgery of the nasal sinuses.

The design has been carried out for me with a very high degree of skill and with great mechanical ingenuity, by Mr. Edwin Haines, of Dublin. I am much indebted to him for his instant comprehension of detail in the problem in hand, and for giving its solution form and substance.

In conclusion, I wish especially to thank Mr. A. A. McConnell, Dr. T. G. Hardman and Professor Evatt for many invaluable suggestions, and Dr. Dorothy Milne Henry for securing the stability of the instrument.

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REVIEWS.

On Bone Formation. By MURK JANSEN, Leiden, Holland.

Manchester: University Press. 1920. Pp. 114.

PROFESSOR JANSEN'S name is associated chiefly with his researches into the nature of achondroplasia. These researches, first published in English form in 1912, gained for him the reputation of an observer of admirable accuracy, reasoning power, and imagination. The same qualities are to the fore in these observations on the nature of bone formation. He is not here concerned with questions of bone growth, as was McEwen in his investigations on periosteal function: rather is his enquiry of a more speculative, philosophical nature—viz., in response to what stimulus does bone formation take place?

In 1867, Culmann and Meyer, in a study of the architectural structure of spongy bone, first advanced the hypothesis that bone formation takes place along the lines of maximum pressure and maximum tension. This theory was supported by Roux's observation on the architectural structure of an ankylosed knee joint, in 1885, and received its final imprimatur in 1892, when J. Wolff enunciated his famous law: "Wheresoever stresses of pressure and tension are caused in a bone, be it by pressing forces or by pulling forces, formation of bone takes place." The opinion that tension as well as pressure forms a trophic stimulus to bone tissue has prevailed almost unchallenged in the orthopædic literature of the past half-century.

Two main questions form the subject of Jansen's investigations: Is bone formation equally stimulated by tension and pressure? Is all bone formation dependent on mechanical stresses exclusively? A systematic analysis of skeletal structure, and a whole series of fresh observations on ankylosed joints, scoliotic vertebrae, and coxae varae, supported by a series of enquiries in comparative osteology (all beautifully illustrated), afford Jansen a sufficient evidence of facts to overthrow the Culmann-Meyer hypothesis, and to replace it by the belief that to pressure alone can a trophic effect on bone formation be assigned. Although apparently

unaware of Lane's investigations, it is interesting to note the similarity of Jansen's conclusions with those of Lane in his observations on the effects of occupational pressure strain in miners and other heavy labourers in '87-'90, prior to the publication of Wolff's Law. Jansen's observations on the normal vertebræ of man and quadruped animals demonstrate a constant lessening, or failure, of cancellous structure wherever pressure stresses diminish, or cease to act: whereas a constant parallel is shown to exist between the amount and density of the contained cancellous tissue and the degree of pressure the bone has to withstand. Nowhere did he meet with crystallisation of bony tissue along lines in whose direction only tension stresses acted.

The clinical importance of these observations lies in the lesson to be drawn, that wherever bone formation is to be promoted (in fractures and transplants), it cannot on any reasonable ground be expected from tension: pressure stresses alone form the trophic stimulus to bone formation.

Wolff's Law represents bony tissue as a material completely plastic in regard to external forces: Jansen would replace this law by another—viz.: "The form of bone being given, the bone elements place or displace themselves in the direction of functional pressure": this is practically the same as John B. Murphy's aphorism, "the amount of growth in a bone depends on the need for it." Jansen considers his "law" to be the only "tenable remnant" of the older law.

In the latter portion of his book, he indulges in many fascinating speculations, and is occasionally difficult to follow in some of his quicker philosophical flights. His philosophy of the "entelechie" is Aristotelian in its recognition of the purposive factors in nature.

WM. DOOLIN.

Syphilis in General Practice, with special reference to the Tropics. By K. K. CHATTERJI. Butterworth and Co., Calcutta. 1920. Pp. xx. + 382.

MR. CHATTERJI tells us that as a result of the praise given in the Ayurvedan to the virtues of the Nim or Margosa tree in the treatment of diseases of the skin, Syphilis and

Leprosy, he was led to make experiments. He has come to the conclusion that it is the Margosa oil which possesses the therapeutic property. From the oil he has extracted an acid which he calls Margosic acid. Esters of this acid possess, in his opinion, parasitotropic and antiprotozoal properties. He advocates the combination of these esters with arsenic and mercury. But since he gives us no information of the results obtained, his observations are not yet of much practical value.

For the rest, the book is, as books on Syphilis must necessarily be, almost entirely a compilation; and the compilation has not had sufficient regard for the essential importance of early and accurate diagnosis, and early and thorough treatment. For example, in discussing the differential diagnosis of the primary sore, while its multiform characters are explained and a comparison with other venereal and non-venereal sores given, yet mention of the direct examination for the spirochete appears only in a table of differential diagnosis. The technique for collection and examination of material is meagrely described in another chapter. Again, the performance of repeated Wassermann tests in doubtful cases of primary sore is not advocated.

In discussing the differential diagnosis of syphilitic disease of the central nervous system, the value of testing the cerebro-spinal fluid is not emphasised.

Constitutional and local treatment are dealt with in separate chapters. There is a careful analysis of the various preparations of salvarsan and mercury, and of the various methods of administering them; but there is no expression of the author's experience or of preference for any particular method. Again, there is no scheme given for the spacing of arsenical dosage, nor any indication given of the number of courses or amount of the drug necessary at particular stages of the disease.

As regards the peculiarities of Syphilis in Indians; skin lesions are more severe; pigmentary changes in the secondary stages are naturally more marked, and the result of depigmentation is, of course, more conspicuous. No mention is made of the nodular syphilide which is frequently found in these countries as a "reminder." Tertiary ulcera-

tion assumes a malignancy which is rare in colder climates. Neglect of treatment and secondary infection probably account for this.

Mr. Chatterji's book gives but little help to the experienced Syphilologist; while to the beginner, the omissions which we have commented on make it an unsafe guide.

Notes on Midwifery. By J. MUNRO KERR and JAMES HENDRY. Glasgow: Maclehose, Jackson & Co. 1920.

THE first edition of these notes were only for private circulation amongst Dr. Munro Kerr's students to serve as notes of his lectures. This, the second edition, has been revised and brought up to date.

They are printed on one side of the page only and contain a few diagrammatic illustrations. The teaching is good; perhaps in the treatment of placenta prævia the limitation of bipolar version might be made more definite.

The notes are only intended for use in association with a text-book, to give a clear classification of the subject to either a student working for his examination or a teacher wishing to rapidly put the headings of his lecture in order, as such they will be found very useful.

J. S. E.

Operative Gynæcology. By H. S. CROSSEN. 2nd Edition.

London: Henry Kimpton, 1920. Pp. 717.

THE key-note of this book is the careful adaption of operative procedures to the repair of pathological conditions present in the individual case.

In this edition, beyond revision and the addition of about 60 new plates, particular attention is given to the classification of operations for prolapse of the uterus and bladder. They are treated in the same way as operations for retroversion were in the first edition—namely, a classification which will shew at a glance the relation of the operation to the anatomical structures involved and the relation of each operation to other operations employed in the particular condition.

Each large subdivision such as operations for prolapse, retroversion or cancer of the uterus is divided into—(1) Technique of operations; (2) indications for operative treatment; (3) choice of operative method; (4) pregnancy in the particular pathological condition and the relation of operation to it.

The chapter on cancer of the uterus is especially good, the various stages of the operation being well illustrated together with the complications which may be met with. Another chapter of note is that on chronic inflammation of the pelvis where indications for operation are gone into very fully.

In the index and text there are one or two false references, otherwise the author is to be congratulated on a work which is likely to be of great use to gynæcologists.

J. S. E.

Le Diabète Sucré. By DR. MARCEL LABBÉ (Professeur de Pathologie Générale à la Faculté de Paris Médecin de la Charité). 1920. Masson et Cie.

In a volume running into 374 pages, the author discusses diabetes mellitus in an original and interesting way. The work is based on his personal observations, extending over many years, both in the laboratory and at the bedside. He divides diabetes into three forms—(1) Diabetes without denutrition in which the metabolism of carbohydrates is alone at fault, and in which the glycosuria and symptoms are due to an ingestion of carbohydrate greater than that which can be dealt with by the organism; in other words, a pathological alimentary hyperglycemia and glycosuria. The patients suffering from this form are usually obese, the obesity preceding the diabetes. These cases, he claims, are simply treated by reduction of carbohydrates. (2) Diabetes with denutrition, rarer than the first, but more grave. Here the patient is in negative nitrogenous equilibrium, uses up as a consequence body proteins and wastes. He cannot tolerate any quantity of carbohydrate, however small, and the glycosuria persists after all carbohydrate has been removed from the diet. In these cases Labbé believes the glycosuria to be derived from carbohydrates, proteins and

fats. It is in this form that acidosis develops; the disease is progressive and usually ends in coma. In our opinion, the form as described by the author must be very rare, for, in our personal experience, failure to abolish glycosuria by suitable diätetic treatment is extremely unusual. (3) Intermediate cases, where the negative nitrogenous equilibrium may be compensated for by increase of ingested protein. In discussing the latter type, the author remarks that a case which previously showed no acidosis developed it on a diet of 10 grams of carbohydrate, 119 grams of protein and 187 grams of fat (body weight not given). He apparently thinks that the development of acidosis is characteristic of a reversion to the second form of diabetes above mentioned, for the patient was at this time losing six grams of nitrogen per day. It would seem to us that the acidosis would be more simply explained by want of balance in the diet, inasmuch as the carbohydrate ration was extremely low when compared with the high protein and fat ration, particularly the latter. The negative nitrogen balance might be due to increased metabolism rate as a result of acidosis. There is a chapter on diagnosis and prognosis. The author says little on the important subject of blood sugar estimations, which is a real fault in the work. There is an interesting discussion on the nature of the polyphagia, palmoplantar xanthochromia, on the nervous symptoms, myalgias and arthralgias accompanying diabetes. The important question of œdema in diabetes with special reference to the action of sodium bicarbonate receives attention. With regard to this question we would like to see the author's ideas supported by more elaborate records than appear in the text, and he gives the impression that he makes free use of large doses of sodium bicarbonate in acidosis, a practice which we believe to be not devoid of danger as a routine. The relationship of diabetes to tuberculosis is also discussed in considerable detail from the point of view of treatment. The relationship of glycosuria to injections and to diseases of the liver and the question of "le diabète bronzé" also receives attention. The author inclines to the view that it is not yet absolutely certain that lesions of the islands of Langerhans are invariably responsible for the production of this disease.

In relation to treatment, the author estimates that in "diabetes without denutrition" the protein ration required to maintain the patient in nitrogenous equilibrium is approximately 1.6 grams per kilogram of body weight; a much larger protein ration he believes to be required in "diabetes with denutrition," but the larger protein ration required may lead to glycosuria and acidosis. The chapters on treatment do not impress us as favourably as the rest of the book.

The survey of diatetics is discussed. The best chapters in the work are those on acidosis and coma, and they will repay reading. However, we cannot agree with the routine treatment of acidosis (without premonitory signs of coma) with large doses of sodium bicarbonate, believing the acidosis can be controlled more fundamentally, quickly and efficiently, as a rule, and with less danger, by diatetic treatment.

We are inclined to feel that Labbé does not sufficiently distinguish between true diabetes mellitus and glycosuria. There is a good bibliography in the book.

HENRY F. MOORE.

Diseases of the Chest and the Principles of Physical Diagnosis. By G. W. NORRIS, A.B., M.D., and H. R. M. LANDIS, A.B., M.D. Second Edition. W. B. Saunders Co. 1920.

THAT the first edition of this work should have been exhausted in less than two years bears eloquent testimony to its sterling worth. The authors may be congratulated on the second edition, which contains new chapters on influenza, streptococcus empyema, chronic inflammatory conditions of the lungs of uncertain origin, and many others. The chapter on influenza is written in the light of the recent pandemic, and is consequently fully up to date.

The electrocardiograph is dealt with in an able and lucid manner by Edward B. Krumbhaar, who gives some excellent tracings. The chapter on subacute infectious endocarditis comprises some of the work that has recently been done on this subject, in particular, that of

Libman. We note the absence in the symptomatology of this disease of all mention of clubbing of the fingers.

A feature of the book is the presence of photographs of frozen sections from the cadaver, previously hardened in formalin, showing the anatomic relations of the tissues during life. Another feature is the stress laid on acoustics, a knowledge of which is deemed necessary for physical diagnosis.

On the whole, we can thoroughly recommend the book, which is one of the best, if not the best on the subject.

L. A.

Lectures on Tropical Ophthalmology. By R. H. ELLIOT.
Henry Frowde, Hodder and Stoughton. London, 1920.
Pp. 36. Price 3/6 net.

THIS pamphlet contains a series of lectures, first written for delivery at the London School of Tropical Medicine.

The lectures deal in outline with the primary and secondary eye diseases most commonly met with in the Tropics, and with those operations in connection with the eye, which the general practitioner may be called upon to perform.

The pamphlet is mainly of interest to the medical reading public as forming the skeleton on which was written the author's "*Tropical Ophthalmology*," the most recent and extensive monograph on this interesting subject.

Anæsthetics: Their Uses and Administration. By DUDLEY WILMOT BUXTON, M.D., B.S. Sixth Edition. London: H. K. Lewis and Co., Ltd. 1920.

THE sixth edition of this book presents many new features. It includes new sections on hæmorrhage and on shock, and embodies some of the experiences gained in the war. Several chapters have been recast, including that on ether and several others.

The work is very complete and up-to-date. It deals with spinal anæsthesia, with anoci-association, with the question of ventricular fibrillation, and presents modern research on these subjects. A little more space might well

have been afforded to anæsthesias by means of mixtures as well as to the use of the ethyl-chloride-ether sequence.

The plates—eight in number—are clear; the print excellent, and the book is not only comprehensive, but very readable.

L. A.

Elements of Practical Medicine. By ALFRED H. CARTER, M.D., M.Sc. Revised by A. G. Gibson, M.A., D.M., F.R.C.P. London: H. K. Lewis and Co., Ltd. 1920.

THE number of small text-books on medicine is legion, and few succeed in justifying their existence. It is questionable whether the student gains much from choosing such books in preference to the larger works on the subject. Often, however, before an examination time is so limited that a small text-book is imperiously necessary, and in such an emergency Dr. Carter's book might well be of signal service.

However, as an "introduction to the study of systematic medicine," the book rather errs by excess of detail. It is perhaps over-ambitious to put into such a small space such a large amount of information. The work includes sections on general pathology, on diseases of the skin, and a therapeutic index.

That this edition is the eleventh speaks for a high degree of popularity.

L. A.

Veneral Diseases: Their Clinical Aspect and Treatment.

By J. E. R. McDONAGH, F.R.C.S., Surgeon, London Lock Hospital; late Hunterian Professor Royal College of Surgeons, etc. William Heinemann, London. 106 Colour and 21 Half-tone Illustrations. Pp. xii. + 420.

THIS book is a most valuable addition to the literature of venereal disease.

The work is, in its way, unique, and nearly every page, and certainly every chapter, contains much that is new, and often something that is startling, to the rather conservative mind of the average medical man. We thoroughly approve

of the author's division of syphilis into the primary, the generalisation, the latent and the recurrent stages; and we agree with him in the importance he attaches to clinical observation and experience rather than laboratory tests.

Mr. McDonagh finds many points to support his view of the life cycle of the leucocytozoon syphilidis in many manifestations of the disease; as, for example, the clinical difference between the ordinary and the experimental chancre; and in the polymorphism which is so diagnostic of the first syphilitic rash.

It is cheering to read that such an eminent authority has come to the conclusion that the infectivity of chronic gonorrhœa is very much over-estimated.

This work ought to be carefully read by all who make a special study of this branch of their profession.

The interest of the text is much enhanced by the very fine colour plates and half-tone illustrations, and the publishers are to be congratulated on a really excellent turn-out.

E. P. M.

Orthopædics for Practitioners. By PAUL BERNARD ROTH.

London: Edward Arnold, 1920. Pp. 190. 57 Illustrations. Price 10/6 net.

THIS book deals with "the commoner deformities likely to be met with in every-day practice," and does not pretend to be a complete text-book of orthopædics. For the most part the author describes in a somewhat dogmatic manner only those methods of treatment which he himself favours. Other methods receive scant notice and are mentioned usually only for purposes of prompt condemnation, so that not all orthopædic surgeons will agree with the views expressed.

Sections dealing with congenital dislocation of the hip, lateral curvature of the spine, and infantile paralysis are clear and good.

The subject of fractures receives less attention than its importance merits in a work of this description. It is confined to fourteen pages, and is not well proportioned: thus, approximately, equal space is devoted to fracture of the neck of the femur and to fracture of the scaphoid bone of the

wrist. To judge from the duration of treatment recommended in certain fractures the author appears to underestimate the time taken in repair and consolidation.

Other important conditions which receive insufficient attention are hip-joint disease, which is disposed of in four pages, and tubercular disease of the knee-joint, the space to which is largely occupied by condemnation of excision of the joint.

The book includes chapters on injuries to peripheral nerves, amputation stumps and artificial limbs, and the treatment of old gunshot injuries. The latter is very inadequate, and would have been better omitted.

On the whole, the book is hardly to be recommended to general practitioners as one to guide them safely through the difficulties and pitfalls of orthopædic surgery.

W. P.

ABSTRACTS OF CURRENT LITERATURE.

MEDICINE.

PEMBERTON, R.: *The Nature of Arthritis and Rheumatoid Conditions*. "Journ. Amer. Med. Association." 1920. 75. 1759.

From a study of four hundred cases of chronic arthritis in the United States army, the author has developed some interesting theories in relation to these conditions, and has elaborated a line of treatment of his own. He believes that a sluggish metabolism brought about by one reason or another, in muscles or joints, is, as a rule, the first link in a chain of events which may result in myositis and arthritis. As a result of the sluggish metabolism, particularly in the muscles (because of the consequent diminished burning of glycogen therein), most patients suffering from these conditions, show a diminished sugar tolerance. He believes that infection foci are not the only agents capable of starting the chain of events which results in rheumatism or arthritis; he holds that a variety of factors, many types of infection, exposure to cold and wet, chronic intestinal conditions, of which we have only imperfect knowledge, and possibly inter-glandular disturbances may induce the metabolic change, which is partly illustrated by a lowered sugar tolerance, and which he believes to be closely connected with the production of these diseases. In addition to the usual therapeutic agencies, he advises in most cases a reduction in the calories of the diet, particularly those derived from carbohydrate. The article is stimulating, but we can hardly agree that the author has fully proved his contentions.

HENRY F. MOORE.

MAXWELL, L. A. I.: *Renal Efficiency and Hyperglycaemia*. "Medical Journal of Australia." December 18, 1920.

Taking the average normal amount of sugar in the blood as 0.11 per cent., the author believes that hyperglycemia in diabetics must be interpreted in the light of renal efficiency examinations. The threshold of renal permeability for glucose lies between 0.15 per cent. and 0.18 per cent. for the normal kidney. If the products of perverted metabolism injure the kidney and diminish its permeability, hyperglycemia may reach a higher level and yet there may be no glycosuria. Judging the functional renal efficiency by the excretion of phenolsulphonephthalein, 58 per cent. of twenty-four cases showed renal insufficiency, and of those showing renal insufficiency, all except two showed hyperglycemia ranging from 0.12 per cent. up to 0.50 per cent. It is not contended that hyperglycemia *per se* injures the kidney, because several of the

patients showed normal renal excretion of the dye where hyperglycemia was present. One case had blood sugar of 0.27 per cent., and yet there was no glycosuria, the explanation was furnished when the renal excretion showed 47 per cent. phenolsulphonaphthalein output for two hours (normal excretion of the dye being 60 to 80 per cent.) despite the fact that the patient had normal blood pressure and no albuminuria. Thus if a determination of the blood sugar is to be of value in prognosis in diabetes, an estimation of renal efficiency is also necessary. In 4-5ths of the 24 diabetics investigated, concentration of the blood had occurred as shown by increased total solids and raised refractive index.

HENRY F. MOORE.

GAUVAIN, H.: *Training in Tuberculosis*. "The British Journal of Tuberculosis." January, 1921.

THIS is a timely article pointing out the advantage of co-ordinated service instead of individual effort. Sir Henry Gauvain considers that "the present need is not so much further expenditure on material, but rather greater effort in the training of the personnel, and co-ordination of the work with a well thought-out and clearly defined policy."

The writer commences at the Medical Schools, and points out that there is not a single professor of tuberculosis in any teaching school in England or Ireland.

A proper teaching unit should afford the fullest facilities for theoretical and practical instruction in all aspects of the tuberculosis problem. And these facilities should be available not only for the student, but also for the practitioner of medicine.

A thoroughly efficient tuberculosis service working with a well-defined policy, and in co-operation with the general practitioner would constitute the most efficient instrument in combating tuberculous disease. It is to the man rather than the method that the attention of the authorities should be directed. The method should follow the trained man not *vice-versa*. F. D.

CHABROL ET BÉNARD: *Cholémie Figmentaire*. "Gazette des Hôpitaux." February 19, 1921.

THESE authors—who belong to the school of Gilbert—discuss the question of jaundice. They divide their article into three chapters. The first deals with the question of hæmolysis in its relation to jaundice and in this connection Chabrol and Bénard point out that fragility of the red cells is neither a constant nor yet an essential phenomena in cases of hæmolytic icterus. The principal factor in this disease, as in all hæmolysis, is the spleen. Over activity of this organ may or may not produce fragility of the corpuscles as shown by testing with salines. In proof they advance the success of splenectomy, an operation which has now been performed on hundreds of occasions in cases of hæmolytic jaundice.

In the second chapter, the authors seek to prove, in opposition to Widal and his followers, that bile-pigment can be formed only by the agency of the liver. They deal furthermore with the important subject of urobilin formation, a subject round which there has raged endless controversy. They put forward three different views. The Gilbert school attributes the formation of urobilin to the kidney; other observers hold that it may be formed in the tissues or blood (Builé); others again that it is by the agencies of the intestine and liver that this substance is produced.

In conclusion the authors state that just as the liver forms bile so also it brings about its retention. Jaundice may be caused by obstruction of intrahepatic capillaries or by a lesion of the parenchyma of the liver. In hæmolytic icterus, the liver is unable to deal with the pigment which it thereupon sends into the blood.

L. ABRAHAMSON.

HENRY MARÉCHAL: *Sodium Cacodylate in Tabetic Crises*. "Gazette des Hôpitaux." February 19, 1921. Paris.

MARÉCHAL advocated in 1918 the more frequent use of sodium cacodylate and introduced the employment of this drug in concentrated solutions, injected intravenously. Since then many affections were treated in this manner by various French physicians with very interesting results.

The author now reports five cases in which he tried this remedy in the treatment of tabetic crises of pain. The solution employed was a fifty per cent. solution in distilled water, and was administered by intravenous injection. The dose varied from one to five grammes.

All five cases were well-marked tabetics. Four complained of well-nigh intolerable pain; the fifth suffered from gastric crises. In all cases, the pain was relieved, as indeed some of the other symptoms. No reaction was ever observed and the amelioration of the pain remained permanent.

L. ABRAHAMSON.

H. B. HIRSH, M.D. *Diathermy An Aid in Empyema*. "Medical Record." New York. December 18, 1920.

HIRSH deals with treatment of empyema by means of diathermy. This treatment was originated at the Hoff General Hospital by Captain C. M. Sampson, chief of the Physiotherapy Service, with whom the writer was associated. Instead of presenting a series of cases, the author contents himself with presenting the first case treated, this case having offered a great variety of difficulties obstructing repair.

The patient, a corporal in the Army, developed acute pleurisy in France on March 15, 1918. On April 1, an operation was performed in a French hospital, a drainage tube being inserted into the chest. The wound united by April 30, but re-opened on August 18,

giving vent to a purulent discharge. Rib-resection with decapsulation was thereupon resorted to, and on December 6—because of osteomyelitis of the eight rib—a radical resection and decortication were performed. This was repeated in January, 1919, but a thick flow of pus continued. Subsequently, rib resertion was carried out on a very extensive scale, the ribs being found necrotic. This necrotis had been marked by a number of sinuses. The patient was closed, and on December 28, it was possible to resort to diathermy, which was given daily to the involved region, one electrode, of Crookes' metal, 22 gauge, shaped like an elongated "O" being applied directly over the inflamed region; the other, much larger, electrode, was held over the anterolateral surface of the left chest. These electrodes were shifted down in the course of treatment. Starting at 300 m.a. for forty minutes, the current was in a few days increased to 650 m.a. for sixty minutes. By January 30, 1920, progress was so favourable that ultra-violet ray treatment was added for systemic effect. Progress continued, and by July the entire wound had closed; all evidence of rib involvement was gone, chest expansion was restored, and respiration seemed normal.

Equally good results occurred in many other cases. The authors recommend that with small electrodes, one should never pass above 700 m.a. though with larger electrodes, they used 2,000 m. in their cases.

L. ABRAHAMSON.

SLATER, S. A.: *Some Interesting Things About Tuberculosis.* "Medical Record." January, 1921.

DR. SLATER points out that the old days when tuberculosis work was looked upon as uninteresting, because hopeless, are past. That the public are going to demand early diagnosis, and will judge the profession by that result, at the same time he does not under-rate the difficulty of an early diagnosis. He also points out the importance of complications and the necessity of early treatment for such.

He also complains of a number of patients being referred to a sanatorium for treatment when they did not have the disease, simply because some member of the family had died of it.

He discusses the question whether the patient should be informed of his condition, and in this we think there should be no two opinions. The patient is entitled to know the facts, and to use his judgment on the case stated.

EVERY-CLAYTON: *Medicine and Surgery. The Bristol Medico-Chirurgical Journal.* December, 1920.

WE have read few addresses of Medical Societies which in a small space cover so much ground both of a controversial and informative character as that of Dr. Every-Clayton in his Presidential Address to the Bristol Medico-Chirurgical Society. The subject was Medicine and Surgery.

The President starts by adopting a definition of disease by the late Dr. Sydney Macilwaine. "Disease is a conception drawn from the observation of a series of cases presenting symptom-groups of determinate and similar causation."

The definition of disease has been a difficulty from the time of Galen and Hippocrates, and had been left at "morbus est vita præter naturam," to which was added as a saving clause, "morbus et vivam in vivo." Sir Clifford Allbutt's definition:—"A disease seems to be a series of events, concurrent and consecutive, that tends to recur with fair uniformity." The *Encyclopædia Britannica* gives "Disease is the correlative of health."

Dr. Every-Clayton goes on to discuss the subject of Medical Education in connection with the recent B.M.A. meeting at Cambridge, and comes to what seems to be a wise conclusion that it is not by the "discard" we can abbreviate the curriculum, but by modification and limitation in the way the essential subjects are taught.

We expect that though the Anatomist may not agree the large body of the Profession will be in accord with his dictum, "Let the Anatomist of the future, then, teach his students with less attention to detail, and more with regard to broad surgical principles."

These are only a few extracts from an admirably concise and interesting address.

F. D

DAVIES, D. S.: *Tuberculosis and Consumption in relation to Public Health*. "Bristol Medico Chirurgical Journal." December, 1920.

STARTING from the fact that about one death in every ten is due to tuberculosis, Dr. Davies emphasises the distinction between Tubercularisation and Consumption. These non-pulmonary (bone, joint, abdominal or gland) forms of tuberculosis may end in latent tuberculosis. This bacillary infection with tuberculosis (tubercularisation), not "Consumption" is compatible in the great majority of subjects with every appearance of health.

Writing of "Immunity" in tuberculosis, Dr. Davies lays stress on the fact that, "Childhood infection may confer a relative not absolute form of immunity."

Sources of Infection. Generally speaking, the human source of infection is four times as important as the bovine, even towards children, while chronic pulmonary phthisis (consumption) is practically always due to infection of human source. "Family" infection is a far greater danger, and leads to greater risk of "massive" infection, than does "bovine" infection. But although bovine infection may account for only 6 per cent. of the total deaths from tuberculosis, yet this means some 3,000 deaths in a year. Every reasonable precaution should be taken to secure a milk supply as free from tubercle as possible, though even if this source of infection were entirely removed the far larger "human" risk still remains.

The Bristol Corporation appears to be making good provision for

all forms of tuberculosis, by open-air schools, special sanatoria, surgical treatment for non-pulmonary tuberculosis as well as for "consumption."

F. D.

BARBER, H. W.: *Alopecia Areata*. "The British Journal of Dermatology and Syphilis." January, 1921.

THE author contends that alopecia is due to focal sepsis. The focus is usually to be found in the teeth or gums, tonsils, nasopharynx or nasal sinuses. This view does not necessarily conflict with the neuropathic theory, nor with Sabouraud's view that the disease is associated with disorders of the ductless glands, as these conditions may also be the result of focal sepsis.

The focus of origin may easily be overlooked. Apical abscesses may only be found by *x*-raying the teeth, and the tonsils require very careful examination to exclude sepsis, which is often present without tonsillar swelling.

Danusz's view is probably correct, namely, that many chronic dermatoses, *e.g.*, psoriasis, scleroderma, alopecia, etc., are the result of a chronic anaphylactic state due to the absorption of foreign proteids, bacterial and other.

In Dr. Barber's series of cases 62 per cent. had infected tonsils, 25 per cent. had oral or tonsillar sepsis, while a much smaller percentage showed nasopharyngitis or ethmoidal suppuration.

The streptococcus pyogenes longus was apparently by far the most frequent responsible organism.

The treatment consists in removal of the septic focus, and subsequent vaccination with the offending organism. In addition internal and local treatment are not neglected.

W. G. HARVEY.

JACOB, F. H.: *A case of Human Glanders*. "British Journal of Dermatology and Syphilis." February, 1921.

THE patient, a man aged 31, was a farmer and attributed the origin of his complaint to the diseased udder of a cow infecting his arm. The primary lesion—an ulcer about the size of a half-crown and situated on the right wrist—discharged freely, and took three weeks to heal. Secondary lesions appeared all over the patient, mainly on the limbs, back and flank. Each lesion commenced as a small papule which spread rapidly and became indurated, resembling a typical Hunterian chancre in feel. The centre was hæmorrhagic, and surrounded by a yellow spreading margin. At the end of a week, having reached a diameter of from 4 to 9 inches, devolution would set in resulting in stained but unindurated areas on which new lesions would soon reappear. Ulceration occurred on the throat and mild lesions on the conjunctivæ. The lymphatic glands, the spleen and the liver were not enlarged. The temperature varied from 100 to 102, and the pulse from 100 to 120. The patient died in about 8 months from the infection.

Histological examination showed the lesions to have the characteristics of human glanders and bacteriologically the case was a bacteriæmia caused by a gram negative bacillus morphologically identical with *B. mallei*. The source of the infection was not determined, no glanders having been found among the patient's horses, or in those of his neighbours.

W. G. HARVEY.

SNELL, A. M., FORD, F., and ROWNTREE, L. G. (University of Minnesota): *Studies in Basal Metabolism*. "Archives Médicales Belges," Vol. 73, No. 6. 1920.

THE authors material comprised about 700 determinations on 350 normal individuals, and many observations on patients suffering from derangement of the endocrine system. The latter included 13 cases of cretinism and myxœdema; 13 cases of exophthalmic goitre (Graves' disease); 11 cases of thyrotoxic adenomata; 22 cases of non-toxic adenomata of the thyroid gland, and 14 cases of adolescent goitre. Seven cases of pituitary trouble (syndrome of Frölich and diabetes insipidus), and some cases of diabetes mellitus, leukæmia and splenomegaly were also examined. The authors believe that the gasometric method is a practical and accurate means for the estimation of the index of basal metabolism; that this index is of great value in the study of thyroid derangements; that it can be used as a reliable guide in the treatment of these conditions; and that it can be used to study the action of drugs on metabolism.

HENRY F. MOORE.

LANGFELDT, E. (Christiana): *The Partial Pancreatectomy*. "Acta Medica Scandinavica," Vol. 53, No. 1. 1920.

THE author has conducted a large series of investigations in experimental chronic diabetes mellitus (brought about by partial pancreatectomy), the work running into 144 printed pages. The test animals used were dogs, and control dogs from the same litter were simultaneously observed. From the time that the pups were weaned, they were fed exclusively upon milk and bread (except during tolerance testing when they received meat), the idea being to "transform" their metabolism so that the latter might be comparable to that of man. The work is too detailed to permit of a short review, and only a few of the author's conclusions can be mentioned. The condition which he succeeded in producing in the dogs that were operated upon, had many points of similarity with human diabetes mellitus both clinically and from a metabolic standpoint. Two puppies which had 8-9ths and 7-8ths of the pancreas removed, had for the first few months after the operation a decreased glucose tolerance. The tolerance then increased absolutely, and relatively in proportion to weight, for about three months; remained at normal for six to eight months, and then declined, until the animals finally developed diabetes mellitus. A full grown dog operated upon in the same way

showed glycosuria *immediately* after the operation. As regards the development of the diabetic state in dogs operated upon when pups, there is first decreased tolerance for glucose, next for starch, next glycosuria is brought on by feeding large quantities of protein, then by feeding small quantities of protein, and finally the glycosuria fails to disappear even after fast days. The lowest observed concentration of blood sugar producing glycosuria was 0.19 per cent. The total quantity of glucose excreted depends not only on the degree of hyperglycosuria, but also on its duration for values over 0.19 per cent. The last factor appears to be the most important. Regarding the mode of action of the internal secretion of the pancreas, the author believes that his results show that the pancreatic internal secretion influences the velocity with which sugar administered *per se* disappears from the blood stream. in other words, that the internal secretion has a *catalytic* effect, through the agency of which glucose is converted into glycogen. He suggests that glycogen formation takes place to as great an extent in the muscles as in the liver. The absence of this slow formation of glycogen in liver and muscles, must in the diabetic organism, result in hyperglycosuria. Anatomical studies carried out on the diabetic animals support the view that the lesion in diabetes mellitus is a degeneration of the islands of Langerhans, and they yield no indications in support of a polyglandular hypothesis.

HENRY F. MOORE.

BLACK, J. H., FOWLER, KENNETH, and PIERCE, PAUL. *Development of the bacterial power of the whole blood and antibodies in serum.*

"The Journal of the American Medical Association."

HEIST and Solis-Cohens described a method of determining the bactericidal power of blood before clotting. Using the pneumococcus they showed that naturally immune animals possessed a high bactericidal titre, while the non-immune did not. This bactericidal activity was present in the absence of agglutinins, complement fixing bodies and opsonins.

Black, Fowler and Pierce have carried out a number of experiments using the Heist-Cohens technic but substituting the typhoid bacillus for the pneumococcus. As a result of their experiments they conclude

1. That the Heist-Cohens method of determining the bactericidal power of the blood is the best criterion of immunity.
2. That the bactericidal power of the blood and serum develop almost identically.
3. That agglutinins and complement fixation bodies are only roughly comparable to the bactericidal power, while the leucocyte count and opsonic index are no index of the immunity.
4. Citrating and defibrinating the blood of immunized animals did not affect the bactericidal activity save to slow the reaction.
5. Inactivation of serum of immunized rabbits did not materially reduce the bactericidal action.

W. G. HARVEY.

Obituary.

BEATTIE, JOSEPH ALOYSIUS. Died November 20, 1920. Born at Athlone, 1847. Educated at Trinity College, Dublin; L.R.C.S.I., 1877; L.R.C.P.I., 1878; late Assistant Medical Officer, Hospital for Insane, Parramatta, New South Wales; late Medical Officer of Little Bay Sanatorium and Small Pox Isolation Hospital; Medical Officer of the State Asylum and Hospital at Limpool, New South Wales; Representative of New South Wales at the International Congress on Tuberculosis, London, 1901. Died at Limpool, New South Wales.

BROWNE, THOMAS HENRY. Died February 15, 1921. Educated at the Ledwich School, Dublin; L.R.C.S.I., 1871; L.R.C.P.I., 1872; Medical Officer of the Frankford Dispensary District, Parsonstown Union, since 1875.

BURKE, JOHN FITZGERALD. Died January 23, 1921. Born at New Quay, Co. Clare, June 14, 1857; L.R.C.P., Edinb., 1882; L.R.C.S., Edinb., 1882; Surgeon-Capt., August, 1885; Major, 1897; served in Egypt as Civil Surgeon, 1882; in Burma, 1885-1887; Ashanti, 1895-1896; West Africa, 1897-1899; South Africa, 1899-1900; retired October, 1902. Died at Tenby.

CAMERON, CHARLES ALEXANDER. Died February 27, 1921. Born in Dublin, July 16, 1830. Educated at the Apothecaries' Hall, the Dublin School of Medicine, and the Ledwich School; L.R.C.P.I., 1868; M.R.C.P.I., 1880; Hon. F.R.C.P.I., 1898; F.R.C.S.I., 1874; D.P.H. (Hon.) R.C.S.I., 1891; M.D. (Hon. Causa), R.U.I., 1896; D.P.H. Cantab., 1877; L.A.H., Dub. (Hon. Causa), 1896; Professor of Chemistry, Steevens' Hospital School, 1858; Professor of Hygiene, 1867, and Chemistry, 1875; R.C.S.I., Secretary, 1892, and President R.C.S.I., 1885-1886; Medical Superintendent and Executive Officer of Health, Dublin; created Companion of the Bath, 1899.

CONNOLLY, PAUL SHELTON. Died November 29, 1920. Born July, 1849. Educated in Dublin; L.R.C.S.I., 1870, and F.R.C.P.I., 1871; Surgeon Army Medical Department September 30, 1871; Surgeon-Major September 30, 1883; served in the Afghan War, 1878-1880; Recruiting Medical Officer, Belfast, 1904-1909.

CULLEN, JAMES ARTHUR WILLIAM. Died January 16, 1921. Born 1891. Educated at Trinity College, Dublin; B.A., B.Ch., B.A.O., and M.B., 1917, Dub.; Lieut., R.A.M.C., on probation, 1914; promoted Captain and

Major District Surgeon Great Indian Peninsular Railway. Died of pneumonia at British Station Hospital, Jhansi, United Provinces, India.

DRURY, RICHARD JOHN. Died February 4, 1921; B.A., M.D., 1873, R.U.I.; L.R.C.S.I., 1874; Consulting Physician, Birmingham and Midland Hospital for Children. Died at Edgbaston.

FISHER, MADDISON WALL. Died February 26, 1921. Born 1844. Educated at the Ledwich School of Medicine, Dublin; L.R.C.P.I., 1865; L.R.C.S.I., 1865; Medical Officer of Mountrath Fever Hospital, Mountmellick Union, Queen's County.

FOSTER, FRANCIS WHELDAL. Died February 4, 1921. Born 1860. Educated at Guy's Hospital, London; M.R.C.S., Eng., 1885; L.R.C.P., Lond., 1891; L.A.H., Dub., 1886; Medical Officer and Public Vaccinator Tendring Union. Died at the Abbey, Thorpe-le-Soken, Essex.

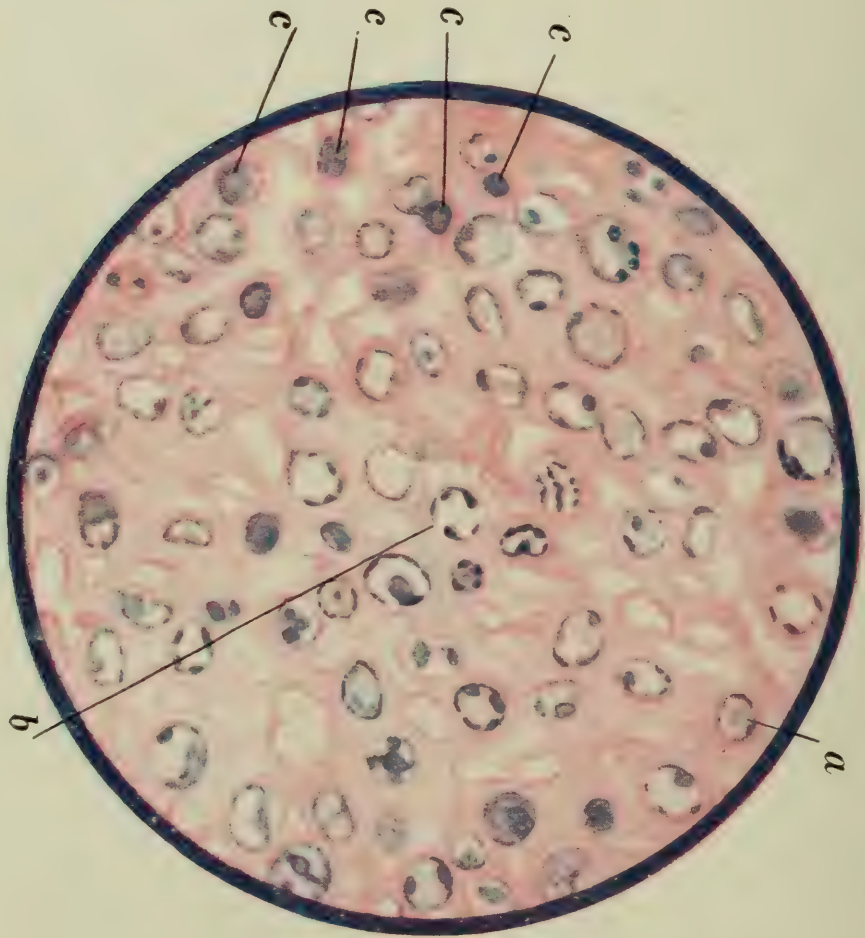
GORHAM, PATRICK CHARLES. Died December, 1920. Born in Galway, 1849. Educated at Queen's College, Galway, Dublin and Edinburgh; L.R.C.P. and L.R.C.S., Edinb., 1874; for forty years Medical Officer of Health Roundstone and Clifden Dispensary Districts, Galway and Medical Officer of the Workhouse and Fever Hospital, Clifden Union.

GIBSON, WILLIAM FREDERICK. Died December, 1920. Born 1889. Educated in Trinity College, Lt. R.A.M.C., 1914; Capt., 1915; served in Gallipoli and France; died at New Ross.

HAMILTON, HENRY THOMAS. Died January 1, 1921. Born 1858. Educated at Charing Cross Hospital; L.S.A., London, 1884; L.R.C.P.I., 1887; formerly Surgeon to the Thames Division Metropolitan Police, and Hon. Physician, Royal Maternity Charity and Boys' Home, Harrow Road, London.

KNOTT, JOHN FREEMAN. Died January 2, 1921. Born at Frenchpark, Co. Roscommon, 1853. Educated at the Royal College of Surgeons, Ireland, and Trinity College, Dublin; L.R.C.P.I., 1877; M.R.C.P.I., 1882; L.R.C.S.I., 1877; F.R.C.S.I., 1880; B.A., 1886; M.B., 1887; B.Ch., 1888; M.A. and M.D., 1889; Dublin, formerly Demonstrator of Anatomy in the Schools of Surgery, Royal College of Surgeons, and Fellow of the Royal Academy of Medicine in Ireland; member of the Royal Irish Academy.

b.—Plasma cell with clear area round the nucleus. The outer part of the protoplasm stains deeply with pylonin.
c.c.—Older plasma cells.



Multiple myeloma (Methyl green and pylonin) showing cells and stroma of the tumour under a high power oil immersion, $1/12$.

a.—Plasma cell with chromatin masses round the periphery of the nucleus. In the centre is the nucleolus stained with pylonin.

PLATE 1.

THE
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OF MEDICINE IN IRELAND

FOURTH SERIES. No. 15.

MAY, 1921

Original Communications.



A CASE OF PLASMOCYTOMA
ASSOCIATED WITH BENCE-JONES
PROTEIN.

By JOHN SPEARES, M.D., F.R.C.P.I., Physician to the
Adelaide Hospital.

IN 1847 Bence-Jones described the characteristics of a protein substance which appeared in the urine in a case of osteomalacia fragilis rubra.

J. Von Rustizky, in 1873, outlined the disease known as "multiple myelomata," regarded as a neoplasm of the bone-marrow, having its origin in the blood-forming cells, and which, in the course of its growth, tends to replace the true bony substance.

Kahler, in 1889, was the first to associate Bence-Jones protein with bone marrow tumours. Up to 1917 over 200 cases of Bence-Jones protein occurring in the urine have been reported, and the greater number of these cases (approx. 80 per cent.) have been associated with "multiple myelomata."¹

It is also stated to have been found in lymphatic and myeloid leukæmia, myxœdema, exophthalmic goitre, carcinoma, nephritis, hypertension, etc.

¹ Walters. Journal A.M.A. 5. 4. 1921.

Further cases of multiple myelomata have been described in which there was no Bence-Jones protein detected in the urine. Therefore, so far as the evidence goes, multiple myelomata and Bence-Jones proteinuria do not necessarily coincide in the same case, but the presence of this particular form of protein in the urine is strongly suggestive of bone-marrow disease.

The following case is one with many points of interest:—

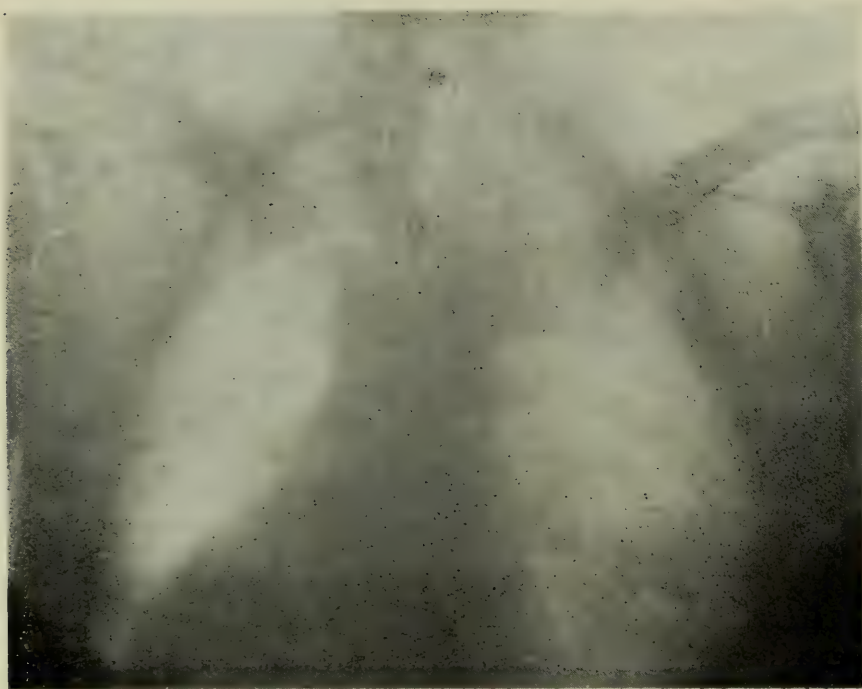
On January 19th, 1921, Mr. E. M., aet 44, was admitted into the Adelaide Hospital. He was unable to stand or walk. He appeared very anemic—his pallor being like that of a case of pernicious anemia. He complained of very severe pain down the outer side of his right leg, of weakness, and also that his tongue was so sore that he could not swallow solid food. His weight on admission was 131 lbs., and he stated that he had been 168 lbs. He had served in the army from 1916-1919, and since his discharge had been acting as a gamekeeper. His family history was unimportant, and he himself had been strong and healthy up to October, 1920, when he began to suffer from intermittent attacks of pain in his right leg, which radiated generally from the ankle region towards the thigh. These attacks of pain were always more severe during the night, and as they gradually became more frequent, he remained in bed, being in practically continuous pain. His tongue commenced to swell; his swallowing became very difficult and at times impossible, and he got progressively weaker. On his admission to the Hospital he was very thin, especially his lower limbs, and his eyes were sunken, his cheek bones prominent, and he appeared to have very little subcutaneous fat. He had slight right lateral scoliosis. On palpating him myriads of small, millet-sized tumors were felt under the skin—some of these moved with the skin, others did not. They were quite universal. His tongue was very swollen and extremely hard. It was indented by his teeth, which were in a carious condition, and he was unable to protrude it more than quarter of an inch. There was a slight ulcer on its right antero-lateral border. He had a faint basal systolic bruit, low B.P., and slightly atheromatous arteries.



The lower jaw showed a curious dense elongated tooth-like excrescence in the lower lip. The whole skull was remarkably translucent.



The whole skull-picture is deficient in X-Ray density, but this is especially remarkable in a crescentic area immediately surrounding the squamous portion of the temporal bone. The skull-wall, though much rarified, is apparently wider than normal.



All the bones in the thoracic picture were most abnormally translucent to X Rays. This translucency, though general, was not homogeneous, but appeared in the ribs as an irregular coarse mottling, which was even more observable in the outer ends of the clavicles.



The Pelvis, in the neighbourhood of the hip, showed irregular coarse blotching, such as is seen in the case of malignant secondaries in bone. Coarse mottling was also marked in the outer part of the Ilium and about the sacro-iliac joint.

PLATE 2.

Lungs.

These were fairly clear, but on February 12th slight dullness was found in both bases, and there was a small area of superficial œdema in his right axilla. He also complained more of pain in his ribs.

Abdomen.

This was curiously doughy on palpation, but otherwise normal.

Nervous System.

Plantar and eye reflexes normal; epigastric reflexes absent; knee-jerks exaggerated on admission; Babinski sign present in left foot; no ankle nor patellar clonus; marked hyperæsthesia in his feet; heat, cold pain, sense of position, localisation, etc., unimpaired; light touch impaired below both knees.

Skeleton.

He had marked bony prominences at the angle of each mandible, conical in shape, that on the right side being the larger. Both mastoid processes were irregularly enlarged. There was much thickening in the region of the chin and marked unevenness of the sacro-iliac joints. He was remarkably tender on percussion over the pelvis generally, and also over the ribs.

Blood.

R.B.C. 3,500,000; white cells, 12,000; differential count, P. 58%; Lym, 40%; Hb. 60%. Wassermann reaction negative. His blood serum was milky in appearance, and contained the Bence-Jones protein; 20 ccms. of blood was sent for laboratory examination.

Urine.

The daily amount averaged 35 oz., with a S.G. varying from 1,016 to 1,022 being acid in reaction. It was milky on being passed, and gave the characteristic Bence-Jones reaction. On heating a ppt. appeared at 44 degs. C., becoming very flocculent, this cleared on further heating (80 degs. C.) and reappeared on cooling. This ppt. was greatly increased by adding common salt to the urine before heating. The nitric acid test gave a very definite ring which almost disappeared on heating and returned on cooling.

With hydrochloric acid this was better shown, but a purplish colour was developed on heating.

Dilute hydrochloric and dilute sulphuric acids gave a ring test.

Diluted urine was more sensitive and showed all the reactions much clearer, as there was a slight amount of ordinary albumen. Examination of the sediment showed it to be principally Bence-Jones protein, and on one occasion urates were precipitated on top of the protein.

Under the microscope the sediment showed long, thin masses of crystalloid forms not very well defined. The sediment gave positive Biuret reaction.

Dr. Walter G. Smith kindly sent me the following note:—

(a) The protein sediment from your case showed, under the microscope, rounded and indistinctly crystalloid forms.

(b) The protein is precipitated by dilute HCl or H_2SO_4 .

(c) The solubility of the primary heat precipitate at 100 degs. is probably due to a labile molecular compound with the urinary salts, which is dissociated upon cooling (Hopkins and Savory).

(d) The sediment gives the ordinary protein reactions, but the yield of aromatic amino-acids is high (Hopkins and Savory).

A provisional diagnosis of cancer of the pelvis was made, his tongue and skin conditions being undetermined. The first x-ray report of pelvis on 25/1/'21 was—"General rarefaction of pelvic bones. Left arch is abnormal."

Bacteriological examination of his mouth failed to explain his tongue condition, and a portion of skin and subcutaneous tissue was removed for examination.

He gradually became weaker; his swallowing became more difficult. He was more tender on pressure over the pelvic area. Rhonchi and râles were heard over the lung bases, and he died on 16th February.

A post mortem and microscopical examination of tissues was made by Prof. A. C. O'Sullivan, F.T.C.D., whose reports are as follow:—

Morbid Anatomy.

The body was that of an extremely wasted man of about 50 years. There was marked colouration of the skin, which was yellow, of a brighter tinge than that seen in cases of pernicious anæmia. Post mortem lividity was present on

the back, and there was evidence of decomposition in the abdominal region. Rigor mortis had passed off. It was possible to feel innumerable subcutaneous nodules about the size of a pin's head. On section of the skin these nodules were not evident to touch and not visible. The subcutaneous fat was very scanty; it was dry and appeared to be less greasy than normal; it felt tough and fibrous. There seemed to be a change in the colour of the fat, which was darker than normal.

The Thorax.

The sternum fractured almost spontaneously when it was being manipulated after disarticulation of the sterno-clavicular joint, the manubrium was a thin shell of bone in which there was a mass of tumor, semi-transparent, in places, with dark red masses lying irregularly embedded in the soft yellowish grey matrix. The tumor was found lying all the way down the sternum, filling the marrow space and in some places expanding so that the bony shell was extremely thin; the trabeculae of bone in the cavity of the sternum had disappeared. About six of the ribs were examined, and all showed the same type of tumor. There was a large mass of tumor filling the sterno-clavicular joint.

The lungs were not adherent. In each pleural cavity there was a small collection of fluid; this was slightly blood-stained. The lungs appeared anæmic. The upper lobes were emphysematous; the lower lobes showed some superficial collapse and some evidence of œdema. The surface of both lungs gave the impression of being rough to the touch; it seemed as if there were very numerous minute hard nodules immediately beneath the visceral pleura.

The præcordial fat had atrophied, and its consistency was hard and tough. The heart was slightly enlarged. There was a complete absence of pericardial fat, and the surface felt rough, as noted in the lungs. The mitral and tricuspid valves were dilated. No other abnormalities were noted.

The Abdomen.

There was advanced post mortem change in the intestines. There was a remarkable absence of abdominal fat; the fat was hard and nodular to the touch.

The intestinal vessels were very remarkable; they were hard and very much thickened, and yet there was no evidence

of calcification. They felt like whipcord, and the lumen was very narrow.

No abnormality was noted in the intestines or stomach. The liver was smaller than normal and showed some evidence of passive congestion. The spleen was slightly enlarged, hard, and brittle. The pancreas showed no macroscopic change. The suprarenal capsules were normal. The right kidney had a tendency to horse-shoe shape; it was pale; the left kidney was normal in size and also pale. There were a few enlarged glands in the retroperitoneal tissue, and some enlarged glands were found in the mesentery.

The Neck.

The tongue was very much enlarged, extremely hard and quite inelastic. On section it was a pale yellow colour, and so tough that there was difficulty in cutting the organ. The appearance of the cut surface did not show the usual strata of muscle. It seemed as if there had been a gelatinous degeneration of the muscles, and that after degeneration the whole organ had coagulated. This is, of course, a figurative expression. The superficial muscles of the neck had also undergone this peculiar change.

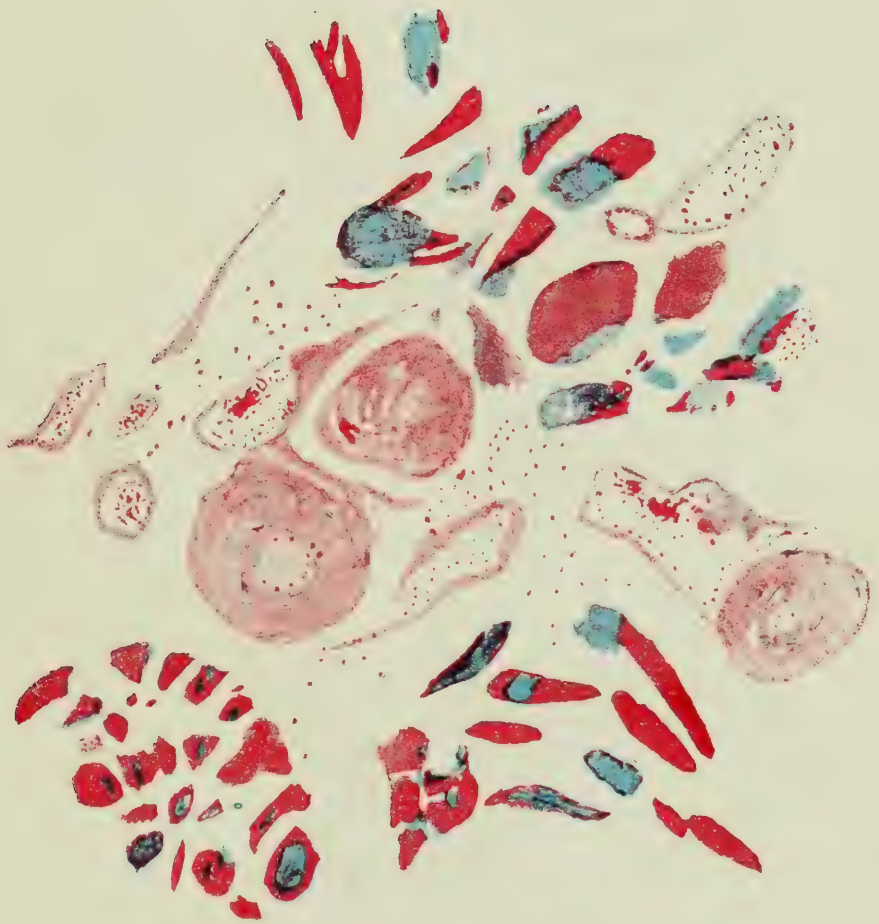
A few enlarged glands were found. The thyroid gland was enlarged and firm. There was no evidence of obstruction to breathing or swallowing.

Definite projections could be felt from the inferior angle of the inferior maxilla; these did not seem to be bony.

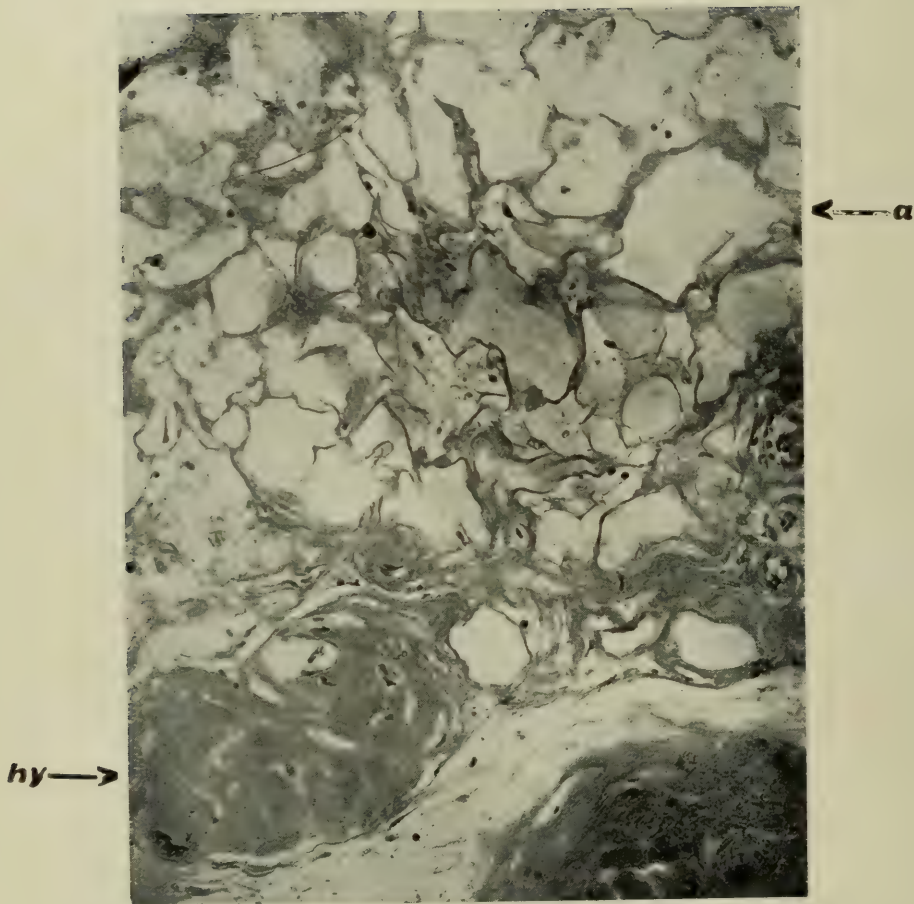
The Bones.

Nearly all the bones examined showed masses of tumor. The clavicle, 6 ribs, the sternum, the great trochanter of the femur, and the left side of the pelvis, all showed masses of tumor where there should have been a medullary cavity. We were unable to examine other bones. We found the skull free from tumors so far as the calvarium was concerned, and the bodies of three vertebræ were roughly examined and did not reveal any tumor.

The tumor had burst through the shell of bone in one place in the left iliac bone, but had not invaded any of the surrounding tissues. There was a very large mass of tumor at the symphysis pubis. All the bones were very soft and extremely easy to break.



Muscle of the neck shewing degenerated muscle fibres (stained blue) and hyaline degeneration of the vessel walls (pink) (carmine and Weigert's fibrin stain).



Adipose tissue with hyaline thickening of the walls of the fat cells.

a.—Fat cell with thickened walls.

hy.—Mass of hyaline material in the wall of an obliterated blood vessel.

PLATE 5.

Histological Pathology.—The Tumor.

The tumor masses were almost entirely composed of separate cells. The stroma was extremely slight, consisting of a few delicate fibrous threads. The walls of the vessels were very thin in most cases, and the stroma in their neighbourhood was more developed, shewing as a network of homogeneous material in which the tumor cells were embedded. In a few places the vessels showed degenerated and greatly thickened walls, the degeneration having the characters of that which will be described later as existing all over the body. The tumor cells were for the most part medium-sized cells of irregular shape. The protoplasm was spongy, full of small, round, unstained spaces. The nuclei were oval or round, sharply marked off by a staining border; the chromatin of the nucleus was usually arranged in three or four masses round this border, and in the centre of the cell was a small, round nucleolus which took on acid stains, and with any stain shewed a slightly different tone from that of the chromatin. With pyronin and methyl green the chromatin stains green, the nucleolus light red and the body of the cell is a spongy network of a deeper red tint. Another type of cell, much less numerous, has one or more round very deeply staining (pyknotic) nuclei and a uniform homogeneous protoplasm which takes on a dark red with pyronin. The form of the elements of the tumor is such as has been described by several writers as a plasma cell, and this class of myeloma has been called a plasmocytoma.

The most noticeable feature in this case from the histological point of view outside the multiple bone tumors is the presence of a widespread degeneration affecting the blood vessels, both arteries and veins, and also connective tissue, especially fat tissue, and that between the bundles of muscle fibres. The substance is like amyloid in appearance, but does not give the amyloid reactions. It is present in the vessels of all parts examined, even here and there in the tumor itself. It is most marked in the vessels of the tongue, the muscles of the neck, the mesenteric vessels and in fat tissue, but it is also present in the kidney, spleen, heart, and to a less extent in the lymphatic glands. Along with this there is a form of coagulation necrosis present in the muscles of the parts affected, and in fat tissue a thicken-

ing of the capsule of the fat globule which gave a peculiar granular or gritty feel to the fat at the post mortem. It also produced the stiffening felt in the mesenteric vessels. The substance does not retain Weigert's fibrin stain, stains a faint pink with Van Geison, and generally shews little affinity for any stain.

It may for want of a better name be called a form of hyaline. The kidney shews very numerous casts filling the collecting tubes, and some of the convoluted tubes; these casts often shew differences in the staining in different parts, being with Van Geison bright yellow in the central part and brown at the periphery.

*Report by Dr. W. R. Fearon, Physiological Laboratory,
Trinity College.*

Qualitative Analysis of Urine. Summary:—

1. Reducing Sugar. Not above normal.
2. Proteins. Bence-Jones Protein present in considerable amount, together with some protein of higher coagulation temperature.
3. Blood Oxidase Reaction. Negative.
4. Diastase. Normal.
5. Indole Reaction. Slight.
6. Rothera's Reaction (acetone and aceto-acetic acid). Negative.
7. Ferric Chloride. Violet Phenolic Reaction, stable on heating. Probably due to drugs.

Hydrogen Ion Concentration. PH 6.65 by Indicator Method of Cole and Onslow.

Summary.

The remarkable features of this case, in addition to the post-mortem appearances and section reports, are:—

- (1) The association of Bence-Jones proteinuria with widespread bone-marrow trouble.
- (2) The presence of skin tumors or deposits.
- (3) The very extraordinary condition of the swollen tongue.
- (4) The progressive weakness, anemia, painful pressure.
- (5) The consistent milky appearance of the urine.

In conclusion, I thank my colleagues at the Adelaide Hospital for their kindly help, especially Dr. W. G. Harvey for his x-ray reports, and my resident, Mr. M. Bewley, who drew attention to the condition of the urine, and did the routine work, and to the workers whose reports are included in the notes.

ACIDS AND ALKALIES. PART II.

The Use of Indicator Papers. A Note on Rothera's Test for Acetone and Aceto-Acetic Acid.*

By WILLIAM FEARON,
Physiological Laboratory, Trinity College, Dublin.

IN laboratory work, the reaction of liquid is generally found by either the electrometric method or the colorimetric method. The electrometric method is an *absolute* method: it consists in measuring directly the potential difference set up between a platinum plate coated with hydrogen, generally spoken of as *the hydrogen electrode*, immersed in the unknown solution, and a similar plate immersed in a standard solution of known hydrogen-ion concentration. In actual practice, the standard solution is replaced by a standard calomel battery or cell. By these means the hydrogen-ion concentration corresponding to a given potential difference can be ascertained.

Various refinements and alterations in the apparatus are being continually introduced. The method requires careful manipulation and attention, which renders it unsuitable for general laboratories, but it is the final tribunal as regards the hydrogen-ion concentration of solutions.

The colorimetric method, which is capable of much wider application, depends on the discovery of a number of dye-stuffs, which can change colour sharply at different degrees of hydrogen-ion concentration. By means of standard solutions and a series of special indicators, it is now possible to determine rapidly and with a very fair degree of accuracy the reactions of many important solutions.

The convenience of litmus papers when the rapid determination of the relative reaction of a solution is required, suggested that a series of papers might be prepared impregnated with various indicator dyes, so as to extend the range. Such a series was briefly described by the present writer in a paper published in this Journal (October, 1918) on the subject of "Urinary Amylase."

* Part I. of this paper appeared in the "Dublin Journal of Medical Science" for December, 1920.

Indicator Papers.

Litmus paper is impregnated with a dye which changes colour in the region of true neutrality ($\text{PH } 7$). For H-ion concentrations above 4×10^{-6} (or $\text{PH } 5.4$), it is definitely *red*; for concentrations below 2×10^{-8} (or $\text{PH } 7.8$), it is definitely *blue*. In the region between $\text{PH } 5.4$ and $\text{PH } 7.8$, its shade varies from purple to violet. These tints may be affected to some extent by the presence of concentrated electrolytes ("salt error"). The limitations of litmus paper will be obvious from the foregoing. For any acid solution from $\text{PH } 5.4$ downwards, the paper will turn *red*, and will not serve to distinguish by its shade the difference between such solutions as nephritic urine of $\text{PH } 5.2$, infant's gastric juice of $\text{PH } 5.0$, decinormal acetic acid of $\text{PH } 2.87$, decinormal hydrochloric acid of $\text{PH } 1.08$, and adult's gastric juice of $\text{PH } 0.9$ to $\text{PH } 1.6$. The same holds for alkaline solutions above $\text{PH } 7.8$. Litmus paper will be *blue* in the presence of all of them. In short, outside its limited region of intermediate shades, litmus can give no direct quantitative information regarding the degree of the acidity or alkalinity which it records.

It is owing to the fact that its turning point is in the region of true neutrality that litmus paper is of general clinical use.

These objections hold for all indicators and indicator papers; outside a narrow zone, they respond equally to varying degrees of acidity or alkalinity.

This region of colour change varies with different indicators, and by constructing a series of indicator papers in the order of their turning points it is possible to determine the reaction of a solution with great rapidity and a very fair degree of accuracy.

For example, phenol phthalein is colourless in solutions below $\text{PH } 8.3$, between $\text{PH } 8.3$ and $\text{PH } 10.0$ it passes from *pale pink* to bright "*cerise*," above this it does not change, unless the alkaline solution is very strong, when the colour of the indicator will be discharged, probably owing to mass-action.

Phenol phthalein paper is now on the market. If a solution be tested with litmus and phenol phthalein papers and

found to react alkaline with the litmus and acid with the phenol phthalein (*i.e.*, a blue colour with one, and no change with the other), its H-ion concentration must lie between $\text{pH } 7.8$ and 8.3 .

Theory of Indicators.

The theory of indicators has already been discussed in this Journal (W. G. Smith, September, 1915), and it is not proposed to consider it any further in the present communication.

As employed in colorimetric measurement, the indicator method is, practically, a comparative method, using the electrometric method as a standard. It is not necessary to know the chemical constitution, or the dissociation constants of the various indicators employed, provided that the H-ion concentrations which bring about the colour changes are known.

[For a more detailed discussion, the reader is referred to a paper by A. A. Noyes, 1910, J. Am. Chem. Soc., 32, 815.]

Theory of Indicator Papers.

This subject does not appear to have received much attention. It is a complicated subject, and may be resolved into two distinct problems:—

(1) The nature of the process by which the indicator dye is taken up by the paper.

(2) The nature of the interaction between the ions of the solution under investigation and the indicator held by the paper.

The first problem belongs to the physical chemistry of dyeing. In the case of the pigments under consideration, the union between dye and paper is almost certainly that of an *adsorption* or condensation of the dye-stuff on the surface of the cellulose fibres in the paper. Bayliss has investigated very thoroughly the adsorption of the dye, "congo red," by filter papers. (1906. "Biochemical Journal," Vol. I., p. 175.)

It does not follow, however, that the interaction between the adsorbed indicator and the ions of the solution under examination will be the same as the interaction between free indicator and solution-ions. To begin with: selective

adsorption may take place in certain solutions. Filter paper immersed in aqueous solutions carries an electro-negative surface charge. If the solution contained an acid, one might expect that some of the hydrogenions of the acid, in virtue of their electro-positive charge, might be drawn to the surface of the paper.

This phenomenon is termed "electro-capillary adsorption," and is known to occur in many systems.

Again: suppose that the solution contains some substance capable of lowering surface tension—for example, if we are trying to determine the relative amount of lactic acid in a specimen of gastric juice free from hydrochloric acid. The substance will be concentrated on the surface, according to a well-known physical principle of Willard Gibbs and J. J. Thomson. This is an example of ordinary or mechanical adsorption.

If either of these adsorptions take place, it will follow that the indicator dye on the paper will be in the presence of a layer of solution of quite a different concentration from that in the main body of the solution.

The relationship between the concentration of the solute on the surface of the paper and that in the main body of the solution may be represented as follows:—

$$A = Ce^n$$

Where A is the concentration of absorbed material on the surface of the paper.

C is the concentration of the same material in the solution.

e is "exponential e," the base of natural logarithms, and has the value 2.7182

n is a constant depending on the particular paper surface and the nature of the solute.

The method of obtaining the above equation is rather complicated, and requires some mathematical knowledge. The equation has been verified by Donnan for an air/liquid surface, and by W. McC. Lewis for a liquid/liquid surface. Recently the present author has devised a method for applying it to liquid/solid surfaces.

This simplified equation will serve to illustrate some of the difficulties to be overcome if the indicator paper method is to be of general clinical use. For example, urine con-

taining bile salts, which are able to lower surface tension considerably, may give a completely misleading reaction when examined by litmus or other test papers. This may seem to be a small matter in view of the slight importance often attached to the result of determining the reaction of a sample of urine. It may be mentioned in passing that this depreciation of the results of qualitative urinary analysis is, in reality, a depreciation of the *method* of analysis and not of the result sought for.

The hydrogenion concentration of the urine at any particular time is a function of the equilibrium constant of the acids and bases in the blood. This is strikingly shown by the well-recognised "acid tide" in the urine before meals and the "alkaline tide" after meals. In each condition, the blood remains constant as regards hydrogenion concentration, but owing to the withdrawal of hydrogenions to form the hydrochloric acid of gastric juice, some of the acid stores of the body are depleted, and the superfluous alkali is excreted in the urine, so that the blood reaction is unaltered.

Hydrogenion measurements have given accurate information of the variations in the reaction of normal and abnormal urine during long periods; it now remains for the chemist to determine the changes in salt content responsible for the alterations in urinary reaction. When that is done, the bewildering problem of urinary calculi and their relation to urinary reaction will be in a fair way to being solved.

Method of Employing Indicator Papers.

From the considerations briefly alluded to, it will be seen that the only satisfactory method of employing indicator papers is to dip the paper into the bulk of the solution under examination and leave it there for a short time.

The common custom of putting a drop of the solution on the test paper almost invariably leads to inaccurate conclusions. The test paper is liable to extract more or less of the solute from the drop of solution, a partition effect results, and the indicator dye will give a result either too high or too low, according to whether it interacts with the concentrated solute on the surface of the paper or the dilute solute in the bulk of the drop.

With litmus paper, the latter condition is what generally occurs.

With many organic solutions it may be necessary to keep the test paper immersed for some time before the final equilibrium tint is reached.

This can be decided by dipping one paper in the solution for ten minutes; then dipping a similar strip of paper in for one minute, withdrawing both strips, and comparing the tint by placing them side by side on a white surface.

If the shades are the same, one may conclude that the equilibrium tint has been reached.

This is of special interest in the determination of the reaction of milk, a subject which will be considered later.

The errors introduced in indicator work by the presence of large quantities of "neutral salts" are probably examples of selective adsorption, referred to previously. The so-called "buffer" or regulator action of certain salts may be shown by the following experiment:—

To a test-tube half-full of water add a couple of drops of strong ammonia, then a drop of phenol phthalein solution (usually made up to 1 per cent. in aqueous alcohol). The alkalinity of the solution due to the ammonia will exceed P^H 10, and the phenol phthalein will give a deep red solution.

Now add to the solution an excess of solid ammonium sulphate crystals, so as to saturate the solution, and leave a layer at the bottom of the test-tube.

There is at first no change; then, above the ammonium sulphate layer a clear ring will be seen to develop in the solution. This is due to hydrolytic dissociation of the ammonium sulphate into ammonia and free sulphuric acid. The number of hydroxyl-ions due to the weak base ammonia will be less than the number of hydrogen-ions due to the strong sulphuric acid, consequently the hydrogen-ion concentration in the region above the solid ammonium sulphate is increased, the P^H falls below 8.3 (since the P^H method of expressing reaction varies inversely with the H-ion concentration, as explained in the first paper on the present subject, *Dublin Jour. Med. Sci.*, Dec., 1920), the phenol phthalein is colourless below P^H 8.3, and, consequently, a clear zone appears in the liquid.

Rothera's Test.

This little experiment is of medical interest, since it affords the probable explanation of the part played by the ammonium sulphate in Rothera's valuable test for acetone and aceto-acetic acid.

Without committing oneself to much as regards the chemistry of the reaction—which has not yet been worked out—the mechanism appears to be as follows:—

Sodium nitroprusside, $\text{Na}_2 \text{Fe} (\text{CN})_5, \text{NO}$, is readily reduced in alkaline solution with the formation of a purple-red unstable pigment.

Creatinine is able to bring about this reduction in the presence of strong alkalies, such as Na.OH and K.OH , but not in the presence of weak alkalies, such as $\text{NH}_4.\text{OH}$.

Acetone and aceto-acetic acid are able to bring about the reduction of nitroprusside in both strong and weak alkalies.

If Na.OH and sodium nitroprusside be added to urine containing creatinine and aceto-acetic acid, the purple colour formed will be ambiguous.

If, on the other hand $\text{NH}_4.\text{OH}$ and nitroprusside be added to urine, the appearance of a purple colour indicates acetone or aceto-acetic acid.

Since creatinine does not react under these conditions, unless a large excess of $\text{NH}_4.\text{OH}$ is employed, this is an important point—in testing for acetone or aceto-acetic acid in urine the $\text{NH}_4.\text{OH}$ added should not be more than one part in ten of the total liquid under examination.

The purple pigment is soon destroyed in alkaline solution, especially in the creatinine test, where there is an excess of alkali. It is more stable in the neutral or faintly acid zone that forms above the layer of ammonium sulphate crystals in Rothera's modification of the test. This probably accounts for the great delicacy of the test, which was shown by Hurtley (1913, "Lancet," April 26th), to indicate one part of aceto-acetic acid in 400,000 in 5 minutes. In his original paper (*J. Physiol.*, 37), Rothera has stated that most of the salts of ammonia have this intensifying effect on the reaction, with the exception of ammonium oxalate, an observation which is of considerable significance in connection with the doubtful constitution of many of the ammonium salts.

SOME IMPRESSIONS OF THE FRENCH SCHOOL OF MEDICINE.*

By L. ABRAHAMSON.

I HAD intended primarily to divide my paper into two parts, the first dealing with some interesting points in the practices and teaching of the French School of Medicine, the second giving some general impressions of this School. However, in view of the ordinary exigencies of time, and still more of the extraordinary limitations imposed on me by present conditions, I have decided to confine my remarks almost entirely to the former aspect of the subject. In order to save time I will classify my remarks as much as possible.

One of the first things to attract my attention during post-graduate work in Paris was the difference that obtained in the teaching of nephritis from that to which I had been accustomed. Instead of classifying nephritis according to morbid anatomy or to etiology, the French adopt a purely clinical classification. Thus chronic nephritis is generally divided into four types: the first, a simple albuminous form—characterised, of course, by albuminuria and nothing else; the second a “hydropigenous” or dropsical form, characterised by the retention of chlorides in the blood; the third a hypertensive form, signalised by high blood pressure; the fourth an azotemic or nitrogenous type, in which we find an increased amount of urea in the blood serum. The forms, of course, may and do merge into each other, but this, to my mind, detracts in no way from the value of the classification which has been extraordinarily fruitful.

Each variety of nephritis possesses, of course, its own symptomatology, but for purposes of accurate diagnosis, prognosis and treatment certain standard tests are performed. Great stress in particular is laid on the dosage of urea in the blood serum, which is done as a routine in every case of nephritis. In this connection Widál has formulated precise rules which have become classical in France. Thus:—

In a chronic nephritis when the amount of urea in the

*A paper read before the Section of Medicine, Royal Academy of Medicine, Feb. 25, 1921.

serum varies from a half to one gramme per litre the prognosis is guarded, but a very long span of life is possible; from one to two grammes the patient, as a general rule, does not live more than two years. Above two grammes death supervenes habitually in less than a year; at five grammes death is imminent. This, of course, does not apply to temporary acute exacerbations of a chronic nephritis. In the lesser degrees of urea retention, the element of food must be considered. For these cases one can work out the constant of Ambard, which compares by a rather complex formula the urea content of the blood with that of the urine.

In the hydropigenous or dropsical nephritis, one can determine the tolerance of the body towards chlorides and establish a fairly definite prognosis by putting the patient first on a salt-free diet, then on a diet containing a known weight of salt, and finally once more on a diet free from chlorides. The normal individual who ingests a quantity of chlorides after having been placed on a salt-free diet retains a certain amount for two or three days, but on the third or fourth day he reaches a state of equilibrium, eliminating as much chlorides as he takes in. The nephritic, on the other hand, takes longer to reach the stage of equilibrium or never reaches it completely. To determine how much chlorides are retained one can resort to the simple expedient of daily weighing the patient, the weight increasing according to amount of salt, retained, or if more scientific accuracy be desired, one can estimate the amount of chlorides eliminated daily in the urine.

Another question that is dealt with is the dilution of the blood, which is said to be of some importance therapeutically as indicating a reduction of liquids. The school of Widal employ for this purpose an instrument which doses the albumin content of the blood serum by means of refractometry, this content varying according to the dilution of the blood. In addition to the above tests the methylene blue and the phenolsulphone-phthalein tests are in current use—the former in particular. Indeed, the number of tests employed is veritably legion, and we could read a very lengthy paper on the “French Laboratory in its Relation to the Study of Nephritis.” These tests are not the heritage

solely of the specialist. The general practitioner can send his specimens to the nearest chemist who is fully equipped to do the work.

Equally numerous are the tests employed in connection with diseases of the liver. To reveal hepatic insufficiency the methods suggested are innumerable. Unfortunately, the vast majority are of questionable utility, and of merely scientific interest. Most of the tests depend on the power of the liver to form urea, and compare the nitrogen content of the urea of the urine or blood-serum to the total nitrogen, a diminution of the former indicating insufficiency.

Brulé, whose work I found extremely interesting, maintains that insomuch as one of the principal functions of the liver is to produce bile, the simplest method of detecting insufficiency of this organ is to determine whether bile is retained in the body. Retention of bile may or may not give rise to jaundice. According to Brulé, the causes of jaundice fall into three groups: the first great cause is hepatic insufficiency; the second, obstruction; and the third, hæmolysis. As the best example of a jaundice, which by its nature can only be due to a lesion of the parenchyma of the liver, one has a form known as "dissociated jaundice"—namely, a jaundice in which there is retention of bile pigments without a corresponding retention of bile salts, or vice versa. A good deal of work has been done on dissociated jaundice, and innumerable examples have been brought forward in France. Particularly common in catarrhal jaundice, especially during convalescence, it may also be encountered in most types of jaundice. Basing himself to a great extent on this form of icterus Brulé attributes to insufficiency of the liver the majority of types of jaundice, such as the catarrhal toxic infectious type, as well as the jaundice of liver diseases, such as cirrhosis.

Whereas, estimation of bile pigments retained in the body can be done with great exactitude by dosing the bilirubin in the blood-serum, there is no reliable method of doing likewise for the bile salts. To determine accurately the retention of bile salts, Brulé and Lemierre devised, in 1910, an ingenious test, demonstrated to me by the former, and which, though destined to be confined to the laboratory, is

nevertheless interesting. The patient is given some bread with thirty grammes of butter, and two hours afterwards a drop of blood is taken and examined with the ultramicroscope. Normally, one can see the particles of fat as shining particles animated with brownian movement. The less of bile salts in the intestine, the fewer fat particles in the blood, and the greater degree consequently of retention in the blood of these salts.

In many cases of retention of bile, we may find no pigment in the urine. In these cases we will find urobilin, which is merely a less toxic modification of bilirubin. The significance of urobilinuria is twofold. In the first place, it may indicate hepatic insufficiency. In this case we also find in the urine bile salts. In the second place, it may be a sign of hæmolytic jaundice, in which case there will be no bile salts in the urine.

In concluding these notes on diseases of the liver, I think that there is a tendency to classify the cirrheses according to clinical manifestations, and the classification of Fiessinger will probably become universal. Fiessinger, following the lead of Widal and Castaigne in kidney diseases, classifies cirrhosis into two great forms:—ascitogenetic and icterogenetic. He objects to the use of the word cirrhosis, for which he substitutes the term, “chronic hepatitis with sclerosis.”

Having dealt with some points which seemed to me interesting in hepatic and renal disease, I should like to treat rapidly of the cardiovascular system, in which I was chiefly interested.

What first attracted my attention in this connection was the great, perhaps overweening, stress laid on the estimation of blood-pressure, both systolic and diastolic—chiefly, perhaps, the latter, and the number of patients under treatment for high blood-pressure alone. Blood-pressure is taken as routine in every case by the student, and new methods of estimating it spring up like mushrooms, bearing tribute in most cases more to the ingenuity of the discoverer than to his commonsense. Two instruments are in common use—the first, discovered by Pachon, affords blood-pressure readings by the oscillatory method; the other, which is in

universal use in Paris, is that of Vaquez and Laubry, which I have brought with me to-night.

Another point which interested me was the employment as a routine in every case of diagnosed or suspected cardiac disease of the *x*-rays. An outline of the heart drawn by the radiographer is appended to the chart of each cardiac case. The method reaches its highest perfection in the clinic of Vaquez. Vaquez and Bordet screen the heart by means of the orthodiagraph, which, by means of a movable ampoule, enables one to throw the rays vertically to each border of the heart. The exact outline of the heart is thus mapped out and measured in two diameters—longitudinal and horizontal. By referring to a table which they have drawn up, and which contains the normal diameters for different weights and ages, those observers determine precisely the amount of cardiac enlargement, if any. Enlargement of individual chambers is determined by turning the patient into various positions. I believe the method to be a very valuable addition to the study of heart disease.

A method of diagnosing cardiac arrhythmias without instrumental aid, other than that of a stethoscope, has been described by Josué, who demonstrated it to me. It consists of auscultation of the jugular vein, and consists of placing a narrow mouth stethoscope very lightly between the two heads of the sternomastoid on the right side, the patient lying on his back, completely flat, his head unsupported. The stethoscope looks downwards, inwards, and backwards towards the mediastinum. Normally, one hears three sounds, which correspond to the "a," "c," "v" waves of polygraphic tracings. These sounds are modified according to the irregularity with which one is dealing. I have tried this method, and found that it requires a practise no less assiduous than that necessitated for successful auscultation of the heart.

Josué has also introduced the amyl-nitrite test to distinguish between a bradycardia of nervous origin and one from a bundle lesion. He prefers it to the atropine test, than which it is quicker and more accurate.

The polygraph is used extensively in Paris. The electrocardiograph is represented by a solitary instrument in the

Vaquez clinic. Examination of the auricular movements by means of a sound in the œsophagus has been tried following the lead of other cardiologists (French and otherwise) by Vaquez. His experiences were illuminating. In the first patient the method succeeding so admirably that it seemed as if the ideal means of procuring auricular tracings had been discovered. The second patient on whom the sound was tried proved refractory; likewise the third. Whereupon inquiries were made from the first patient, which revealed the information that he was a professional sword-swallower.

From the clinical aspect, the thing which astonished me most was that in Paris, where Laennec discovered the stethoscope, the use of this instrument is limited to the minority, immediate auscultation being the rule. The student may possess a blood-pressure instrument or a percussion hammer for "nerve" cases, but he will rarely be the proud possessor of a stethoscope, the use of which is generally discouraged by his chiefs. In fact, there are sounds which, we are told, can only be heard by immediate auscultation; as, for example, the "bruit de galop," or gallop rhythm, a veritably ubiquitous phenomenon, carefully sought for in all cases of chronic nephritis, where its presence will mean a failing left ventricle. I am fully prepared to believe that the "bruit de galop" is not to be heard by mediate auscultation, as it was missed by me on innumerable occasions. I never heard it better, however, when I discarded my stethoscope, and I was inclined to think that the "bruit de galop" may well have been at times the figment of over-active imaginations.

Another matter of interest was to observe how much French cardiology owed to Dublin men, in particular to Stokes. I felt very gratified at this until I began asking my fellow-students whether they could tell me who Stokes was. To my horror, they replied invariably that he was an Englishman or an American.

In this connection I noted that aortic disease was divided into two types—the one, called Corrigan's Disease, is a valve lesion, following endocarditis; the second, called Hodgson's Disease, is of syphilitic origin, and produced by

a dilatation of the aorta, easily revealed by *x*-ray. The latter variety seemed to me the commoner. Mitral stenosis is also divided into two groups—the one, endocarditic; in which we have a coexisting regurgitation; the other, a pure form, called Du Roziez's Disease, and held by a majority of observers to be congenital.

In the therapeutics of heart disease Vaquez has introduced the drug Ouabaine, which was isolated by Prof. Arnauld from *Strophanthus Gratus*. This drug is said to act directly on the myocardium, and is indicated in those cases in which digitalis is inefficacious; above all, in failing left ventricle. It may be combined with digitalis to advantage. It is prescribed in doses of a quarter to half a milligramme daily intravenously for three or four days.

Just as in cardiac disease, the *x*-rays have arrogated such extreme importance, so also in disease of the respiratory tract. Every case of phthisis is screened on one or more occasions. Whilst I believe that this is a useful procedure if performed by an expert, and interpreted in the light of accurate clinical observation, I am inclined to think that there are too many sources of error to justify its use as a routine. Generally speaking, *x*-ray examination seems likely to become an obsession with the French physician. In the treatment of phthisis work was being done by injections of the salts of rare metals, these being chosen presumably because of their rarity.

Some interesting work has been done by Widal and his school on the question of anaphylaxis. He based his work on certain phenomena known to occur experimentally in all cases of anaphylactic shock. These phenomena include: lowered blood-pressure, leukopenia, changes in the coagulability and in the refractometric index of the blood. These, with others, Widal grouped, under the name "*hæmoclastic crisis*." He proceeded to search for them clinically and was able to demonstrate the *hæmoclastic crisis* in a man who developed an attack of asthma whenever he was brought into contact with sheep. The crisis developed in this man at varying intervals before the asthma supervened. Other workers subsequently added similar observations, and were able to demonstrate the *hæmoclastic shock* in other diseases,

on the nature of which they were thus able to throw light. Widal was also able to demonstrate the blood-crisis so characteristic of anaphylaxis in paroxysmal hæmoglobinuria, which he deems to be a form of anaphylactic shock, following the action of cold. Latterly, he has been using the same method for diagnostic purposes—for example, as a means of diagnosing hepatic insufficiency, in which disease the injection of a certain amount of proteid is followed by the phenomena of the hæmoclastic crisis. I wish also to refer to a means of diagnosing diabetes, published last week by Widal. The patient is given twenty grammes of glucose by the mouth, his white-cell count having been previously determined. Twenty minutes afterwards the white cells of his blood are again counted. A positive reaction is indicated by a leukopenia, which may reduce the number of white cells to almost half the normal. The other phenomena of the hæmoclastic crisis are also present, but clinically it is unnecessary to look for them.

I will now come to the question of therapeutics, and I think I am justified in saying that here we have the weak point in the practises of the French School. Cupping and scarification of the skin are performed in practically every case, extraordinary efficacy being attributed to them. Venesection, too, is in ever-increasing vogue. Great stress, moreover, is laid on cut-and-dried dietaries, which are invested with far more importance than would, I think, be attributed to them here. A few points in special therapeutics may be of interest. Thus, in connection with encephalitis lethargica, of which I was able to see a number of cases, Netter tried to revive in Paris treatment by fixation-abscess. This method he advocated in all grave cases, the technique being as follows:—Two ccs. of essence of turpentine are injected under the skin of the external aspect of the thigh, at the junction of the upper and middle thirds. At the end of three or four days pus begins to form. When fluctuation appears, an incision is made and a drain inserted. Suppuration ceases, as a rule, in seven or eight days. As to the efficacy of this method, opinions are divided. Another line of treatment, likewise introduced by Netter, is treatment by sialogues, such as pilocarpine. This line

of treatment was suggested by the clinical observation that in many cases of encephalitis lethargica the parotid gland increased appreciably in size and a great number of patients showed increased salivation. Whether this treatment, propounded whilst I was in France, has proved a success, I cannot say.

I was interested in some work carried out by Pierre Marie in the treatment of epilepsy by means of a double tartrate—the “tartrate borico-potassique.” This drug he finds to have many advantages over borax, which had, of course, been introduced by Gowers, and to give results as good as that given by the bromides, without the inconveniences of the latter. It may be prescribed in doses of three grammes daily.

In conclusion, if I may be allowed to put before you a general impression, it is this: that the French School of Medicine is a school extraordinarily prolific of new ideas. Some of these are fantastic, and deservedly still-born; others reach a successful culmination, and form a valuable addition to medical science; others, again, disappear, returning after a longer or shorter interval to the horizon of the discoverer, who finds with exasperation that they are labelled with the name of another—often a German—worker, who was able to bring them to a practical issue.

HERPES AS A TYPE OF VICARIOUS MENSTRUATION.

By BETHEL SOLOMONS, M.D., F.R.C.P.I.,

Gynæcologist to Mercer's Hospital, Dublin

IN February last, C. W., aged 27, was referred to me by Dr. Wallace Beatty. She complained of getting a sore on her left cheek every month, which Dr. Beatty described as catarrhal herpes; it remains for about a week and consists of a small cluster of small vesicles on the left cheek; sometimes it consists of one large vesicle which is probably the result of coalescence of several smaller ones. There is the faintest (almost imperceptible) mark after the herpes has disappeared. When it is present she gets the sensations which some women feel previous to menstruation.

She had been given medicine by various doctors to bring on the flow; these had been without effect, and there had never been any sign of vaginal discharge. The herpetic eruption commenced when she was eighteen and had appeared monthly ever since.

On examination the patient was found to be fully developed. Under an anæsthetic a bimanual examination was made and absence of the uterus tubes and ovaries was diagnosed. As the case appeared to be full of interest, and as it was thought well to confirm the diagnosis of absence of the uterus, especially in order to prevent the continued administration of drugs, the abdomen was opened. At first sight it appeared as if none of the internal genital organs were present, for in place of the uterus tubes and ovaries a cord-like structure, slightly less in circumference than the normal round ligaments, was found stretching from one internal abdominal ring to the other. There were no tubes, but on a close examination of the right side of the abdomen an ovary of normal size was found attached to a very thin fold of peritoneum, which might have been intended to represent the broad ligament; this ovary was anterior to the peritoneal fold and had very slender attachments. No ovarian or ovario-pelvic ligament was present, and the

ovary must have been supplied with blood from some circulation in the peritoneum in which it was nestling. The appendix was examined, was found to be inflamed, and was removed. The abdomen was then closed.

Blair Bell¹ describes true vicarious menstruation as occurring when the patient bleeds from some mucous surface other than the endometrium, or in the absence of or with rudimentary development of the uterus. In the first type of case the vicarious menstruation takes the place of menstruation or leads to its suppression, and in the second, which is very rare, vicarious menstruation represents menstruation. My case belongs to the latter class, except that, according to the definition, it cannot be classed as vicarious menstruation. However, if an herpetic eruption could be taken as equivalent to a menstrual flow the definition of Dorland²: "A menstrual flow from some part or organ other than the vagina" would allow it to be ranked as a definite case of vicarious menstruation, especially in view of the absence of the organs. Rinsema,³ who has, apparently devoted much time to this subject, states in a recent paper that herpes menstrualis, as he calls it, is found nearly always on the genitals or face. It has been described on the buttocks, back of the hands, breasts and cervix uteri. Antipyrin is a common cause. Rinsema's case is different to mine in that herpes preceded menstruation and the woman had several pregnancies.

The explanation of the case I have mentioned is not easy; there was probably some fault in internal gland secretion due to the absence of important organs. It would appear possible that the rupture of the graafian follicle and the formation of a corpus luteum caused some change to occur in the general circulatory or gland apparatus, which was followed by the presence of the herpes. It would have been an interesting experiment to remove the ovary in order to determine if its removal would cure the skin affection, but the patient would have suffered by the absence of the secretion from the ovary. Most authorities recommend that where the uterus is absent and vicarious menstruation occurs, that the latter should not be stopped as it relieves congestion.

The main points of notice in my case are (1) the position of the herpes; (2) its occurrence at cyclical periods; (3) there was *no* menstruation; (4) the absence of organs.

I am much indebted to Dr. Wallace Beatty for the case and for his valuable assistance.

REFERENCES.

1. New System of Gynæcology. Vol. I., p. 374.
2. Dorland. Medical Dictionary.
3. Rinsema. Acta Dermato-Venereologica. Vol. I. Fasc. I. 1920. P. 87.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

TWO BOOKS ON OPHTHALMOLOGY.

(1) *Manual of Ophthalmic Practice*. By F. P. MAYNARD, Lieut.-Colonel, I.M.S. (retired). London: E. & S. Livingstone. 1920. Pp. xxi+316. Price 25s.

(2) *Manual of Ophthalmic Operations*. By F. P. MAYNARD, Lieut.-Colonel, I.M.S. (retired). 2nd Edition. London: E. & S. Livingstone. 1920. Pp. xix+248. Price 21s.

(1) THIS is a very useful and readable book. It gives us the fruits of the wide experience which falls to the lot of the ophthalmic surgeon in India who has attained to real eminence in his speciality.

A feature of the book is its essentially practical point of view. The chapter on examination of the eyes is fuller and more detailed than is usually found in ophthalmic manuals.

Some of the opinions advanced by the author may not meet with general acceptance. For example, in the chapter on trachoma, he states that "trachoma patients are most of them hypermetropic. Very rarely the myopics suffer from it . . . possibly myopics are protected from infection by wearing glasses." We confess that we do not see our way to subscribe to this doctrine. It is not easy to understand how myopia or the wearing of glasses can be any real protection against an infection which, as the author points out, is usually carried by an infected towel or water or flies.

In the chapter on iritis and cyclitis, more importance might be attached to the part played by oral sepsis and intestinal toxæmia in some of these cases; but, no doubt, this is explained by the fact that the author's practice has lain largely amongst Indians.

The book is well printed and handsomely illustrated, and we sincerely congratulate Colonel Maynard on its production.

(2) WE welcome the second edition of this useful book. It is not, and does not pretend to be, an exhaustive compendium of ophthalmic surgery; but it sets clearly and concisely

before the reader those operations which Colonel Maynard, after long experience, thinks to be the best. The student is not bewildered by a long procession of operative procedures, though possibly in some cases the pruning process has been carried a little far.

The book contains a great deal of sound, practical information. There is a good chapter on asepsis and theatre technique.

The chapters on cataract are, we think, the best in the book. We would especially direct attention to the way in which the author has dealt with the various accidents and complications which may occur during and after extraction.

The treatment of squint is a little jejune. Only one operation (Prince's) for advancement is described. In the next edition we suggest that this chapter of the book might be amplified with advantage. On the whole, the manual is excellent.

W. C. MACF.

Sanitary Law in Question and Answer. By CHARLES PORTER, M.D. 2nd Edition. 1920. London: Longmans, Green & Co. Pp. xvi+180.

THIS is another work designed to smooth the path of the student of public health. The Sanitary Law of England and Ireland is a vast and intricate subject, and we cannot think that a more easy introduction to the subject could be devised than the plan Dr. Porter has followed. The work is divided into two parts—I., the Public Health Acts; II., Allied Acts. Each of these parts is sub-divided into sections dealing with the various branches of sanitation, and the subdivisions of the sections are made clear by special type. The form of Question and Answer is employed, and this keeps before the student the questions on the law he is likely to be asked, and the answers themselves show how the questions should be answered, and are as they stand model summaries of the law. We feel little doubt that candidates for the D.P.H. examination in England will be grateful to Dr. Porter for his book, which is bound to be of real assistance to them in this dull and difficult part of their work. The edition is fully up-to-date.

An Epitome of Hydrotherapy. By SIMON BARUCH, M.D.
London: W. B. Saunders Co. 1920. Pp. 205.

THOSE physicians who have not yet grasped the therapeutic value of such a common article as water would do well to read this monograph by a well-known American authority. Most text-books on *Materia Medica* and *Therapeutics* are deficient, incorrect, or entirely omit instruction in this very important branch. In this work, however, Dr. Baruch presents us with a good summary of the healing virtues of water, exact indications for its use in disease, and a full account of the rationale and mode of its application. His descriptions of how to carry out the sheet-bath, wet pack, wet compress, the continuous (or as he calls it, the hammock) bath, are lucid, and show what can be accomplished in the way of home procedures by the ordinary physician. The use of baths in hospital, sanatoria and health resorts are also fully described, and a valuable chapter for the guidance of nurses is included. Another feature of the work is a special chapter for the guidance of architects in planning "lay-outs" of instalments, etc.

We are sure that the physician whose knowledge is backward or who has failed to realise fully what can be accomplished by hydrotherapy will find the study of this epitome both stimulating and profitable.

Hygiene. By W. WILSON JAMESON, M.A., and F. T. MARCHANT, M.S.San.I. London: J. & A. Churchill. 1920. Pp. 404.

THIS book is intended to be an epitome of the subject, and has been specially prepared for students who wish to revise rapidly their knowledge before sitting for the D.P.H. examination. We have read it carefully, and consider that it fulfils completely its object. It is well printed and indexed, contains at the end a useful list of standard texts on general hygiene and on special branches. We note that careful references have been given throughout the text to the latest special reports (*e.g.*, L.G.B. Reports, U.S.P.H. Service Reports, etc.) where required.

The book is in sections (not chapters), and one whole

section is devoted to Infantile Mortality, Maternity and Child Welfare and School Hygiene, subjects which have come greatly into prominence in recent years. Useful formulæ, etc., are collected in Section X., while another special section is devoted to notes on Chemistry as it affects Public Health work. Altogether it is a most useful and accurate compendium for those for whom it is intended, and would well repay perusal by every practitioner of medicine.

The House-Fly. By MAJOR E. E. AUSTEN, D.S.O., British Museum (Natural History), Economic Series, No. 1A. 1920. Pp. 52. 8vo. Illustrated.

FAMILIARITY breeds contempt. Everyone is familiar with the house-fly—in fact, a great deal more familiar than he would wish—but most people are content to regard it as a necessary evil, and take no further interest in the matter.

This little work gives a clear account of the habits and life history of the house-fly, which, in addition to being of great interest in themselves, enable one to take the most effective measures to rid oneself of the pest. Full details are given of various methods used for the destruction of the house-fly in the different stages of its development. The author confesses that the problem of how the house-fly survives the winter is still unsolved. The booklet furnishes a profitable and interesting half-hour's reading.

V. M. S.

Text-Book of Embryology. By PRENTIS AREY. W. B. Saunders Company. Third Edition.

THE fact that this book is now in the third edition tells of a demand which it undoubtedly meets.

It is described as a Laboratory Manual and Text-Book of Embryology, and though, like all compromises, it fails to be one or the other, it is something more than a good attempt to embody the two methods.

The work is profusely and beautifully illustrated, and

without the illustrations it would be difficult for a beginner in the subject to follow the text.

The drawings of dissections of human and pig embryos are most instructive, and instructions on how to prepare such dissections are very clearly given in Chapter VI. The author apparently hopes to educate his reader in the subject of embryology with the aid of the illustrations. The temptation to teach the student any practical subject by means of drawings however carefully selected must be rigidly guarded against.

The chick, pig and human embryos are the types the author has made most use of in tracing the history of the development of man. The transverse sections through the chick embryos are somewhat difficult to follow, and might profitably be replaced by diagrams.

On page 73 the propriety of the use of the word trophoderm, which is defined as a primitive ectoderm, is very questionable. In the last paragraph on page 79 the terms entoderm and yolk sac are loosely and indifferently used. In figure 255 it would be difficult to guess what Fg. stands for, and in connection with the same figure the reader will wonder why Spl. mes. could not have done duty for splanchnic mesoderm. The book is provided with a full and accurate index. The print is large and clear, and the work may be confidently recommended to teachers and senior students of embryology.

E. J. R. E.

Gout. By LLEWELLYN JONES LLEWELLYN, M.B., London, Governor and Senior Physician, Royal Mineral Water Hospital, Bath; Fellow of Royal Society of Medicine. With a Section on *Ocular Disease in the Gouty*. By W. M. BEAUMONT, Consulting Ophthalmic Surgeon to the South-Western Region of the Ministry of Pensions. London: William Heinemann (Medical Books), Ltd. 1920.

WRITING from a very wide and ripe experience, Doctor Llewellyn has produced a singularly interesting and thoroughly comprehensive book on Gout. The book is learned, but not pedantic, and the style is so easy that one

picks it up with interest, after a long day's work. He deals with gout from every standpoint—historical, etiological, pathological, etc., etc.—and in particular devotes about one-fourth of the entire volume, of about 450 pages, to the very important subject of treatment. His chapter on diet is written in an admirably philosophical spirit; moderation in all things, rather than the exclusion of any special article of diet, being the gospel which he mainly preaches. The importance of intestinal antisepsis is also laid stress on. From the point of view of drugs, the author has little new to tell us, but some of the details which he refers to, though minor from one point of view, will be found extremely useful in practice. We have much pleasure in commending this book as thoroughly up to date on the subject with which it deals.

A Text-Book of Pathology. By W. G. MACCALLUM. Second Edition. W. B. Saunders.

THE fact that a second edition of this work has appeared within the comparatively brief period of four years, is a proof of acceptability and value. The revision of the volume, exhaustive as it is, has been largely necessitated by the marked progress of research during the years of the European conflict; but, in addition, the original text with its illustrations has been entirely overhauled. In reference to this latter feature, one cannot fail to be impressed by the vast superiority of accurate drawings of naked-eye and histological preparations, to the photographic method of reproduction, which in our opinion will not enjoy in future the degree of employment as a method of representation which it has during the past decade. The drawings of Mr. Alfred Femberg in this volume are beyond all praise.

Much of the criticism directed against the work, upon its first appearance, was misdirected. It aims at representing the tradition and teaching of a school—not at providing the student with another of those innumerable texts, divided into water-tight compartments, wholly inapplicable to the science of pathology in actual practice, and incapable of affording any comprehensive grasp of the unity of the sub-

ject. Such treatises may be compared to a Japanese drawing, where all the detail, although perfect, is on the one plane, devoid of perspective; and it is precisely that perspective, in an intellectual sense, that MacCallum supplies. Moreover, its reappearance emphasises the growing importance of the American Continent as a scientific centre, yet another aspect of the great re-shuffle of the cards, now that the world, as we dare hope, has decided to beat swords into ploughshares.

J. H. P.

A Handbook of Midwifery for Midwives, Maternity Nurses and Obstetric Dressers. 5th Edition. By COMYNS BERKELEY, M.A., M.C., M.D., Cantab.; F.R.C.P., London; M.R.C.S., England. Cassell and Co. 7/6 net. With Coloured Frontispiece and 74 illustrations. 532 pages.

THE author states that in this edition the section on breast-feeding and the chapter on artificial feeding have been re-written, in all 65 pages are devoted to the infant, and include its physiology and pathology and prematurity. The chapter on antenatal care is well written and contains much valuable advice.

Constant reference is made to the C.M.B., and the book should prove useful to those who propose to take this examination. Considerable stress is laid, and quite rightly so, on the importance of the early recognition of cancer of the uterus, its symptoms and signs gone into, and a paragraph entitled "What Every Woman Should Know" gives the symptoms which should lead a woman to have herself examined should she suffer from any of them.

The subject of venereal disease is thoroughly dealt with; the author refers to Rule E 21 (2) of the C.M.B.: "The midwife is bound to report to a doctor the fact that a patient who has engaged her services is suffering from a purulent discharge, or sores of the genitals."

Under the heading of "Articles Required by the Midwife" we have been unable to find any mention of rubber gloves. One article specified is an "antiseptic lubricant for smearing the fingers, catheters, nozzles," solution of mercury in glycerin (1 in 1,000).

It would seem to us a somewhat doubtful policy to recom-

mend a midwife to purchase such an article, as the use of a lubricant, even if antiseptic, by a midwife, might "in practice" reduce the chances of an aseptic delivery.

In the chapter on the management of normal labour, and the paragraph on examination of the patient (vaginal) might be made to include the necessary cleansing of the genitals, hands, etc., and the wearing of rubber gloves. In our opinion too great stress cannot be laid on this matter.

The rules of the labour theatre and lying-in wards of the City of London Lying-in Hospital and Middlesex Hospital are given near the end of the book.

Here again rubber gloves are not insisted on, save when a pathological vaginal discharge or sores are present on the vulva.

We are glad to note here that no emollient is to be used in making a vaginal examination.

The final chapter contains questions and answers founded on the rules of the C.M.B. (1916).

The little book contains a considerable amount of valuable information, and should be of use to those for whom it is intended.

R. E. T.

ABSTRACTS OF CURRENT LITERATURE.

GYNAECOLOGY AND OBSTETRICS.

WELTON, T. S.: *Double Flap Low Cæsarian Section Results*. "The American Journal of Obstetrics and Gynæcology." January, 1921.

THE author performed this operation 11 times from November, 1919, to August, 1920. Although the majority of these women were potentially infected at the time of operation, and although 6 of them were infected according to the temperature charts, there was no case of peritonitis, and the maternal mortality was nil.

For a description of the operation the author quotes from a paper by Beck:—"The essential features include a low abdominal incision, stripping the bladder with its peritoneal covering from the lower segment of the uterus, dissecting away the peritoneum from the uterus above the bladder incision, incising the uterus in this exposed area, delivering the child, closure of wound in uterus and overlapping of peritoneal flaps so as to seal the uterine wound."

The author himself employs the transverse incision of the abdomen just above the pubes.

Of the 11 cases, 2 were not in labour, 3 were in labour from 10 to 24 hours; 3 were in labour 24 to 36 hours; 1 in labour 36 to 48 hours; 2 in labour more than 48 hours. Membranes not ruptured in 2 cases; ruptured less than 10 hours, 2 cases; ruptured 10 to 24 hours, 4; ruptured 24 to 36 hours, 1 case; ruptured 36 to 48 hours, 2.

Vaginal examinations, none in 1 case; 2 in 2 cases; 3 in 1 case, many examinations in 7 cases.

The author considers that this operation should be the operation of choice in all potentially infected cases. The uterine wound being so completely peritonealised that adhesions and post operative disturbances are greatly minimised.

R. E. T.

JOSEPH L. BAER: *Indirect Expulsion of the Placenta*. "Journal of American Med. Association." February 26th, 1921.

THE author in this article outlines the history of the various methods employed in accomplishing the delivery of the placenta.

After detailing the various signs which enable the accoucheur to recognise that separation of the placenta has occurred, he describes his own procedure. In this plan he utilises the full power of the abdominal muscles to drive the uterus down against the separated placenta and thus expel it. After waiting for the usual period of about

30 minutes, the placenta being separated, the uterus in the middle line and well contracted, the abdominal wall is grasped transversely by one or both hands above the umbilicus, the fingers stretching on one side, beyond the rectus, and the thumbs at a corresponding point outside the other rectus.

The recti are then firmly pulled together thus taking up all the slack in the abdominal wall. The woman is now urged to bear down just as during the second stage. Co-operation is essential, but need only last a minute, the placenta being expelled as in a spontaneous case. The method is only applicable after separation of the placenta has taken place. The author states that in a series of 400 consecutive cases in his hospital complete success was attained in 86 per cent. of cases. The gratifying feature of this series consisted, according to the author, in the procedure being successfully carried out by nineteen students who were in residence at the time.

L. C.

G. E. W. HENDERSON: *A Case of Painless Labour in a Primipara.*
 "Edinburgh Med. Journal." March, 1921.

THE author reports a confinement case in a primipara that was unattended by pain throughout the three stages. The patient was æt 23, a farmer's wife, who, during the whole of pregnancy, worked hard on the farm. Pains came on at 9 a.m. and the whole labour was complete at 3 p.m. the same day. The child weighed 7 lbs.

The contractions of the uterus were perfectly regular as evidenced by palpation of the uterus; even when the perineum was stretched by the head, which was an L.O.A. the patient did not complain of any pain. All the reflexes tested after the birth were perfectly normal as were the sensations to heat, touch and cold.

The intestines exhibited painful contractions after the administration of aloin, proving that all of her involuntary muscle did not contract in the same painless fashion.

L. C.

LUDWIG A. EMGE: *Varicose Veins of the Female Pelvis.* "Surgery, Gynæcology and Obstetrics." February, 1921.

IN his preliminary report of 35 cases dealing with varicose veins of the female pelvis, the author puts forward a strong plea for the more systematic recognition and treatment of this condition.

According to his observations women suffering from varicosities of the pampiniform plexus present one characteristic symptom, namely pain. If this pain is carefully analysed it will be found that it appeared at a fairly definite time, is worse after long standing and is relieved by the recumbent position. Examination of the patient recto-vaginally in the ordinary gynæcological position and then getting her to drop her legs, at the same time raising the body, causes the veins to fill and renders them palpable. Other pelvic

conditions can be excluded by ordinary clinical methods aided by differential blood count and urinary examinations. The author does not recommend resection of these veins from a curative point of view. He adopts some form of high suspension of the uterus, *e.g.*, a modified Gilliam operation, associated with a shortening of the uterosacral ligaments. In all the cases he has been able to follow up so far, he has found complete cure of symptoms.

L. C.

CONSTANTINESCO: *Cæsarean Section as treatment for penetrating wounds of the abdomen and gravid uterus.* "Press. Med." February, 1921.

A woman, pregnant near term, was admitted to hospital having received a wound in the abdomen from a cow's horn. The wound was angular in shape, horizontal from the right side to the umbilicus and from that vertically down. At the angle of the wound the umbilical cord was projecting and there was a slow flow of liquor amnii from it. Cæsarean Section performed, the wound being opened up and the soiled tissues excised. In the fundus there was a wound 2 to 2½ inches long with an arm and the cord projecting, wound enlarged, and a living child extracted, a wick of gauze pushed through to the vagina, uterus closed with two layers of cat-gut, peritoneum completely closed, and the abdominal wound drained at the upper angle. Patient had an uneventful recovery.

Two lines of treatment are defined in such cases:—1. Wound seen soon after accident, Cæsarean section and double drainage. 2. Wounds seen 24 to 48 hours after accident, Cæsarean section with hysterectomy and double drainage.

J. S. E.

BOURRET: *Symptoms and Treatment of Accidental Hæmorrhage.* "Gaz. des Hop." January, 1921.

Bourret divides the cases into two classes—1. Simple cases which may not be recognised until after the birth of the placenta, or regarded as excessive show. 2. Complex cases requiring active treatment.

The first type he dismisses with a few words, in the second he lays stress on the following points:—1. It generally occurs in multiparæ, who are toxæmic. Eclampsism is the term he uses to denote the state. 2. The pains are constant not rythmical, they are radiated to the kidney region, increasing in intensity as time goes on. 3. Variable amount of hæmorrhage from the vagina may be present. 4. Increasing tenseness of the uterus, most easily recognisable during vaginal examination.

As regards treatment of simple cases he advocates rupture of the membranes in one type, in another, manual dilatation of the cervix and extraction. In the complex cases the uterus must be emptied as soon as the anæmia is treated, should such be necessary. This he does by either manual dilatation followed by extraction or by Cæsarean section depending on whether the cervix is dilated,

dilatable or not. Abdominal Cæsarean section should be of the Porro type if the membranes have ruptured long, simple classical if the uterus contracts well, followed by hysterectomy should it not; vaginal Cæsarean section is advocated in cases of the worst type as he considers there is less shock, no chance of infection of the peritoneum and above all less loss of blood. J.S.E.

KING, J. E. : *Endocrine influence, mental and physical, in women.*
 "American Journal of Obstetrics and Gynæcology." January, 1921.

"THERE is no question as to the influence of the ductless glands upon man's vital physiologic processes," and it is probably the basic influence of his mental processes and emotions. It is thought that from those glands may originate the various emotions and mental status accompanying reproduction. Normally there exists between the glands a well balanced relationship.

Menstruation :—Why at the age of 14 should the changes of puberty take place ?

In young animals removal of the thymus causes precocious sexual development, also removal of the posterior lobe of the pituitary, results either in failure of the sex characteristics to appear, or in reversion to the infantile type. It may be assumed that the thymus during the earlier years exerts an inhibitory influence on the pituitary. Atrophy of the thymus being more or less complete at the age of 14. The pituitary thus freed from restraint stimulates the ovary, which results in the activation of the interstitial cells, and the consequent appearance of the secondary sexual characteristics. The corpus luteum develops from the Graafian follicle and menstruation and ovulation are established.

The pituitary in large measure is to be considered as a sex gland. The corpus luteum also has a distinct secretion. Observers claim to have isolated two substances from the corpus luteum, one influencing the time of menstruation and the other the amount of the flow.

A hyperadrenal secretion occurring during the period of disturbed endocrine balance at menstruation may account for the disturbed mental status sometimes occurring at this time.

Havelock Ellis states that Lombroso found that out of 80 women arrested for opposition to the police or for assault, all but 9 were menstruating at the time.

Pregnancy. "A woman during pregnancy is on the threshold of pathology." "Her border line position might be accounted for by an imperfect readjustment of her endocrine balance." There seems to be much to indicate that the enlargement of the thyroid is a compensatory one, in order to furnish a substance to neutralise the increased and unusual toxins elaborated by mother and foetus. The normal and exaggerated pigmentation seem to be due to the influence of the adrenals. It is possible to ascribe certain manifestations of disturbed metabolism, seen during and following pregnancy. An unusual hypertrophy of the gland (pituitary) so great as to cause

pressure upon the optic nerves, accounts for certain instances of total or partial blindness sometimes encountered.

"There will one day probably be proof that uterine contractions at term are initiated by a liberation of pituitrin through the withdrawal of some inhibiting influence exerted upon the gland during pregnancy."

"There is good reason to regard the corpus luteum as the source of the inhibiting agent. Women who in the early weeks of pregnancy are willing to undergo any danger to be rid of pregnancy, as term approaches gradually experience a change of feeling, and at delivery are reconciled and happy."

"Equally striking is the sudden revulsion of feeling which is observed when the young have reached an age to care for themselves." Undoubtedly this so-called instinct arises from some secretory influence, probably the pituitary. "As the young grow, and the pituitary, relapses to normal, the animal cares no more for her young."

Another prominent attribute of the mother is courage.

Menopause. "It is unquestionably the loss of ovarian secretions that accomplishes the physical changes."

The loss may result in either hyper or hypo activity in other glands. The most common instance is hypothyroidism indicated by increase in weight and tendency to uterine bleeding.

The vaso motor effects ("hot flashes") indicate adrenal influence.

R. E. T.

GRAD, H.: *An Analysis of 50 cases of Ectopic Gestation.* "American Journal of Obstetrics and Gynæcology." January, 1921.

Clinically the cases divide themselves into four groups.

1. Ectopic gestation with negligible hæmorrhage.
2. Ectopic gestation with moderate hæmorrhage.
3. Ectopic gestation with severe hæmorrhage.
4. Ectopic gestation with fatal hæmorrhage.

37 were in the first group, 4 in the 2nd, 7 in the 3rd, and 2 were fatal cases from hæmorrhage.

Of the 37 in the 1st group, pain was the most prominent symptom in 26, uterine bleeding in 11.

Of the cases in the first group only 25 per cent. were correctly diagnosed, in the 2nd group, 50 per cent., group 3 and 4, all cases.

In one case, from the presence of fresh arterial blood in the abdomen, the author considers that the tube must have ruptured during the preparation of the patient for operation; "with the patient anæsthetised and the protective rigidity of the abdominal muscles removed, the patient is unable to protect herself.

In treating the 3rd group of cases, a donor should be at hand for blood transfusion, which is started before the abdominal incision is made, and the transfusion is carried on during the operation and ended after the abdomen is closed. Gentle manipulation is essential.

The operation should not be started until about 200 ccs. of blood have been transfused. The operation should be of short duration. It is not necessary to clean up the peritoneal cavity.

For cases with syncope in addition to collapse and shock, he suggests that they should be infused with gum glucose or saline and gum before being moved to hospital, and a donor obtained for blood transfusion while this is being done.

Morphia given for relief of pain, and extremities bandaged, etc.

With the pulse even partially restored the patient may be transferred to the operating room, where a blood transfusion of several hundred ccs. may be given. The blood transfusion is continued during the operation, and ended with the closure of the abdomen

R. E. T.

ANÆSTHETICS.

LATHROP (Hazleton-Pa.): *Ether-oil Colonic Anæsthesia*. "Journal of the American Medical Association." July 10, 1920.

LATHROP's experience with the method described has been derived from 1,002 cases, 884 of which were operations for the different varieties of goitre.

The technique of administration adopted is as follows:—The patient should be under observation for twenty-four hours or more. Exophthalmic cases and those in which hyperthyroid conditions are present require special observation and preliminary treatment.

The evening before operation an enema of soap-suds (2 pints) is given. A second enema of 1 or 2 pints of clear tepid water is given early next morning. Supposing the operation is set for 11 a.m., then at 9.30, 2 drams of olive oil (warm), 3 drams of paraldehyde, and 4 drams of ether are given. The patient should be kept as quiet as possible. At 9.50, $\frac{1}{4}$ grain of morphin and 1-150 grain of atropin are given hypodermically.

At 10.20, 3 or 4 ounces of ether and 2 ounces of olive oil (warm) are given. The oil and the ether are put in a bottle and shaken thoroughly. The patient should lie on the left side with both knees flexed, the right acutely. A rectal or colon tube with a funnel should be inserted not more than 6 inches, care being taken to have the mixture in the tube and all air expelled, before inserting. The mouth and nose should be covered with several thicknesses of gauze.

The injection should be given slowly *about one ounce a minute*, the funnel being held about 3 inches above the level of the patient. The tube should be clamped and allowed to remain in the rectum so that the mixture may be withdrawn during the operation if there should be any indication for doing so. If there is any excitement 15 or 20 drops of chloroform usually quiets the patient. If the patient cannot retain the oil-ether mixture, the method should be abandoned. The patient should be ready for operation in from twenty to thirty

minutes from the time the last injection is given. The reversed Trendelenburg position seems to aid in maintaining an even plane of anæsthesia. The jaw should be supported. In alcoholic subjects 1-100 grain of scopolamin (hyoscin) is added to the preliminary hypodermic injection of morphin. When the operation is completed the bowel should be irrigated with tepid water until the return is clear. One pint of water is then put in the bowel and left, or olive oil 4 ounces to prevent any possible irritation. Hyperthyroidism or exophthalmia offers a striking example of the value of this method. The procedure with these patients is as follows—a week previous to operation a daily injection of 2 ounces of tap-water with a dram of ether in it is given. This, the patient is told is for its tonic effect. On the morning of the operation she is given the regular dose of ether-oil and paraldehyde, followed by hypodermic and the full mixture, all given while she is in bed. She goes to sleep quietly, although at times requiring a few drops of chloroform, is taken to the operation-room, the gland is removed or ligation performed, and when she awakens she is in her bed with little or no knowledge of what has taken place. The psychic factor is eliminated or greatly lessened.

Lathrop is in accord with Gwathmey's conclusions that the method insures prevention of shock, narcosis is smooth and of uniform depth, pulse and respiration remain near normal. A complete relaxation of the muscular system is secured. The stage of excitement is eliminated. The patient receives a warm, moist vapour and the direct irritation of a concentrated vapour is overcome. There is no eructation of gas, before or after, in 95 per cent. of cases. Hypersecretion of mucus and saliva is absent. The patient's stomach, lungs and kidneys are spared. The absence of the ether cone in surgery of the head and neck lessens the technical difficulties of the operation by giving continuous access to the field of operation.

The method is contra-indicated in conditions of rectal disease or when pain is caused by its introduction.

ALFRED E. BOYD.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

President—A. PARSONS.

Secretary—G. E. NESBITT.

February 25th, 1921.

Discussion on Dr. Abrahamson's paper.

DR. SYNGE said that an amazing number of tests were in use and that new ones were being constantly added. He thought, however, that many of them were not so useful as they claimed to be. The constant of Ambard, to which great importance was attached, was very cumbrous. He was surprised to find that the pharmacist did Wasserman reactions and bacteriology. Dermatology was particularly good. He considered the organisation of post-graduate teaching poor, and he noticed that few Frenchmen took advantage of the courses.

DR. MOORHEAD thought that the tendency to clinical classification of disease as distinct from pathological was retrograde. He instanced the numerous recent classifications of Lethargic Encephalitis and Poliomyelitis based on clinical features, which merely confused the subject.

DR. NESBITT said that he had recently attended the Centenary of the French Academy of Medicine, and while in Paris had an opportunity of visiting many of the hospitals. Dr. Abrahamson's paper gave an admirable summary of his impressions also, and he agreed with almost all his observations. The outstanding features of French hospital practice seemed to be the importance attached to pathological Chemistry and to *x-ray* examination. He paid a warm tribute to the universal courtesy he had met with. The French school was very anxious to encourage foreign intercourse, and had an elaborate organisation with a bureau in the Ecole de Médecine, where all information could be obtained.

SECTION OF ANATOMY AND PHYSIOLOGY.

President—HAROLD PRINGLE.

Secretary—WILLIAM FEARON.

Friday, February 11th, 1921.

Communication.—“*A Note on the Female Prostate.*” By PROFESSOR E. J. EVATT AND DR. LOUIS CASSIDY. *Read by* DR. CASSIDY. The prostate is a large bi-lobar gland surrounding the neck of the bladder and resting upon the urino-genital diaphragm.

At the fourth month of foetal life, the prostate has probably reached its maximum period of development in the male, at this period it is equally well developed in the female, in fact the structure of the gland is indistinguishable in the two sexes. In each case the prostate is enveloped by a fibro-muscular capsule. The anterior segment of this capsule is composed of striped muscular fibres, and forms what is known as the prostatic muscle. From the fourth month of foetal life onwards, the female prostate begins to regress, this phenomenon is undoubtedly associated with the probability that in the female, the prostate is a non-functionating organ having been derived from a male ancestor. The fibro-muscular capsule persists, however, to form the sphincter muscle of the urethra. Observation leads us to believe that the ducts of the female prostate successively disappear from above downwards so that well marked traces of the prostatic tubules are to be seen at the lower end of the urethra in a seven months' child. It may be noted that the prostatic tubules do not persist as the crypts of the female urethra, these latter are probably of later origin. The zone occupied by the female prostate after the disappearance of its extensive glandular structure, is filled up by fibrous tissue and a very thick turgescient mucous membrane. This condition is to be seen in female children of one year old. This condition of extensive fibrous walls and thick mucous membrane does not exist in the urethra in the adult female. Now, if the disappearance of the prostate in the female is not followed by a satisfactory replacement of that structure by fibrous tissue and contraction of the prostatic muscle, a weak spot will be left in the hiatus genitalis through which, later on, a vaginal prolapse of the anterior vaginal wall may occur. This fact may account in some degree for those not uncommon cases of cystocele in nullipara.

PROFESSOR A. F. DIXON advanced some criticisms of the author's belief that the ducts of the female prostate disappear in succession from above downwards.

THE PRESIDENT (PROFESSOR PRINGLE) spoke of the physiological interest of this presentation of the subject, in view of the theories regarding the function of the prostate.

PROFESSOR EVATT briefly replied.

Communication. "The Nature of the internal secretion of the Pancreas." By DR. W. CROFTON.

DR. CROFTON said that the orthodox concept of the internal secretion of the pancreas as a hormone was, to his mind, at variance with experimental evidence. He preferred to regard it as the specific heat-stable component of a substance, the heat-labile component being found in the tissue cells. He considered that the glycogen formation could be best explained by enzyme synthesis from glucose, and quoted, in support, the work of Cohnheim, Starling, Clarke, and others. The fact that the pancreatic internal secretion appeared

to be necessary for the formation of glycogen suggested a similarity of action to the enzymes.

He advanced evidence for the existence of a substance in the blood and pancreas which was concerned with fat-metabolism and which he considered to be deficient in cases of faulty fat metabolism met with in diabetes.

Dr. Crofton also suggested that the substance formed in tissues of the autolysis of foreign protein was formed in the pancreas, and instanced the research of McGowan, and his own observations on the result of inoculations in diabetes in support of this hypothesis. Such a substance, he believes, comes from the cell-islets of the pancreas.

By an application of Beard's theory of the alternation of Generation in Vertebrates, it may be hazarded that this "co-ferment" is necessary to adapt the cell enzymes to the zymolysis (hydrolysis or polymerisation) of otherwise unaffected stereo-metrically isomeric substances.

The communication was adversely criticised in some detail by PROFESSOR ADRIAN STOKES, DR. H. STOKES, and DR. G. NESBITT. Owing to time restrictions, the communication by MR. A. K. HENRY on "An Abnormality of the Ulnar Nerve," and the demonstration by the Secretary (DR. W. R. FEARON) of "A New Colour Test for Proteins," were taken as having been made.

OBITUARY.

ABBOTT, WILLIAM FREDERICK. Died February 28, 1921. Born 1858. Educated at the Ledwich School, Dublin; L.R.C.S., Edin., 1884; L.A.H., Dublin., 1884; Temporary Lieutenant, R.A.M.C., April, 7, 1915; Capt., 1916; Major, 1918; Medical Officer, Military Hospital, Lewisham.

ABRAHAM, PHINEAS SIMON. Died February 23, 1921. Born in Jamaica, 1847. Educated at University College, London, St. Bartholomew's Hospital, and Trinity College, Dublin; B.A., 1871; M.A., 1875; M.B. and M.D., 1886; B.Sc., London; F.R.C.S.I., 1880. Formerly Curator of the Museum of the Royal College of Surgeons in Ireland, and Lecturer in Physiology and Histology in the Westminster Hospital Medical School; Dermatologist to the West-London Hospital. Died in London.

BEESTON, JOSEPH LIEVESLEY. Died March 8, 1921. Born September 19, 1859. L.R.C.P.I., 1882; L.R.C.S.I., 1882; Colonel, Army Medical Corps, Australian Imperial Force; served in the Dardanelles, 1914-1915; mentioned in Dispatches; created C.M.G., 1915. Died in New South Wales.

CONNOLLY, NICHOLAS THOMAS. Died February 10, 1921. Born 1839. Educated at R.C.S.I., L.R.C.S.I., 1860; entered Naval Medical Service; Fleet Surgeon, September 25, 1883; Deputy Inspector-General, February 11, 1894; Service in East Africa; Medal with Clasp, 1890. Died at St. Jean de Luz, France.

DAVY, WILLIAM ROBERT. Died March 17, 1921. Born in Dublin, March 12, 1869. Educated at Rathmines School and Trinity College, Dublin; Lic. Med., Lic. Ch., Lic. Obs., 1895, Dub.; Medical Officer of Fanad Dispensary District, Milford Union, Co. Donegal. J.P.

DOBBS, ARTHUR FRANCIS. Died April 20, 1921. Born 1856. Educated at Trinity College, Dublin; B.A., 1873; B.Ch., M.B., 1877. For thirty-five years in practice at Athlone, where he died suddenly.

HANLEY, ALLAN HASTINGS. Died April 24, 1921. Born in Co. Roscommon, 1863. Educated at the Royal College of Surgeons, Ireland; L.R.C.S.I., 1883; F.R.C.S.I., 1894; L.R.C.P.I., 1892; Senior Medical Officer, Aro Ex-

pedition; Late Deputy Principal Medical Officer, Southern Nigeria; Medical Superintendent, Peamount Sanatorium. Dublin. Created C.M.G., 1903.

KENNY, JOHN DROUGHT. Died March 9, 1921. Educated at Queen's College, Galway, the Ledwich School, Dublin, and the Adelaide Hospital; M.D., M.Ch., 1884, R.U.I.; Medical Officer, Maltby District, Rotherham Union, Yorks. Died at Wickersley, Yorks, of Pneumonia.

KERANS, THOMAS GEORGE. Died April 24, 1921. Born Ahascragh, Co. Galway, October 7, 1839. Educated Royal College of Surgeons, Ireland, and Meath Hospital; L.R.C.P.I., 1869; L.R.C.S.I., 1869; M.R.C.P.I., 1883; formerly Lieutenant. 84th Regt. Died at Cheltenham.

LEE JOHN HACKETT. Died February 11, 1921. Born 1844. Educated at the Ledwich School, Dublin; L.A.H., Dub., 1867; L.R.C.S.I., 1894; late House Surgeon of Limerick County Infirmary; Resident Apothecary City Dispensary, Limerick, and Visiting Apothecary to the Limerick District Lunatic Asylum.

MACDONAGH, JAMES DOUGLAS. Died January 25, 1921. Educated at the Royal College of Surgeons, Ireland; L.R.C.S.I., 1885; L.R.C.P.I., 1898; D.P.H., R.C.P. and S.I., 1906; formerly of Bettws-y-Coed, North Wales. Died at Kingstown, Co. Dublin.

McWALTER, JAMES CHARLES. Died February 5, 1921. Born in Dublin, 1868. Educated at the Catholic University School, Dublin, L.R.C.S.I., 1897; L.A.H., Dub., 1897; D.P.H., R.C.P. and S.I., 1900; F.R.F.P.S., Glasgow, 1900; B.A., 1900; M.A., 1901; LL.D., 1914, N.U.I.; M.D., Bray, 1903; M.D., Durh., 1912; B.A., M.B., 1913; M.A., 1916; M.D., 1917, Dub.; LL.D., Ottawa, 1916; M.A., Alberta, 1916; Barrister-at-Law, King's Inns, 1907; M.R.I.A.; High Sheriff City of Dublin and Alderman; late Captain R.A.M.C.

MOSSE, CHARLES GEORGE DRUMMOND. Died February 25, 1921. Born at Kingston, Jamaica, August 22, 1857. Educated at the Royal College of Surgeons in Ireland; L.R.C.S.I., 1879; L.R.C.P.I., 1880; F.R.C.S.I., 1888; Surgeon-Capt., Feb. 5, 1881; Major, Feb. 5, 1893; Lt.-Colonel, Feb. 5, 1901; Retired October 17, 1908; Service West Africa, 1883; South Africa, 1899-1902; Great War, 1915. Afterwards employed in Ministry of Pensions. Died at Weymouth.

O'CONNELL, MATHEW DANIEL. Died January 22,

1921. Born in Cork, April 5, 1847. Educated at Queen's College, Cork; M.D., M.Ch., 1869, R.U.I.; L.M.R.C.P.I., 1870; Surgeon, Army Medical Department, April 1, 1871; Surgeon-Major, April 1, 1883; Surgeon Lt.-Col., April 1; 1891; Brig.-Surgeon Lt.-Col., November 7, 1895; Col., April 10, 1901; retired, April 5, 1907; service North-West Frontier, India, 1897-1898. Died at Leeds.

POWER, THOMAS. Died February 16, 1921. Educated in Dublin; L.R.C.P., Lond., 1871; J.P.; Public Vaccinator Bromley District Poplar Union. Died in London.

RAMSBOTTOM, ALFRED ERNEST WILLIAM. Died April 16, 1921. Born at Grahamstown, South Africa, in 1860. Educated at Bloemfontein and Dublin. L.R.C.P.I., 1883; L.R.C.S.I., 1882; F.R.C.S.I., 1896; M.D., Durh., 1902; Chief Medical Officer to the Free State forces in Boer War; First Administrator of the Orange Free State. Died in London.

ROCHE, CHARLES. Died March 14, 1921. Born Co. Kerry, 1891. Educated in Royal College of Surgeons in Ireland; L.R.C.P. & S.I., 1914; Capt., R.A.M.C., January, 1915; Military Cross, 1916; Bar to M.C., 1918. Died at Aberdeen of illness engendered on active service.

ROSS, GEORGE CUMBERLAND. Died February 26, 1921. Educated at the Royal College of Surgeons in Ireland; L.R.C.S.I., 1864; L.R.C.P.I., 1865; late Surgeon-Colonel, Indian Medical Service, Bengal. Died at Milano, Italy.

SHANAHAN, JOHN FRANCIS. Died April 1, 1921. Educated at the Catholic University School and the Mater and St. Vincent's Hospitals. L.R.C.P.I., 1873; L.R.C.S.I., 1873; formerly Medical Officer, Dewsbury District General Infirmary; for seven years Medical Officer of Adare Dispensary and for thirty-one years of the City of Limerick Dispensary. Retired 1916.

SHEIL, JOHN JAMES. Died March 18, 1921. Educated at the Catholic University School, Dublin; M.B., B.Ch., B.A.O., 1908, Royal University, Ireland. Died at his residence, Swanlinbar, Co. Cavan.

STOREY, JAMES ALEXANDER. Died March 10, 1921. Born 1849. Educated at the Carmichael School, Dublin; L.R.C.S.I., 1870; L.R.C.P., Edin., 1873; late Medical Officer of Health, Dunstable, Beds. Died at Dunstable.

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ACUTE INTUSSUSCEPTION IN
CHILDREN.

By C. J. MACAULEY, M.B., F.R.C.S., Eng.; Surgeon,
Mater Misericordiæ Hospital.

DESPITE the fact, now generally recognised, that there are few acute surgical conditions of the abdomen in which prompt operative treatment has such life-saving results, it is a matter of painful experience that many cases of acute intussusception in children are not recognised at a stage when such results may be confidently expected. This is all the more regrettable when one considers that the symptoms and physical signs, in the vast majority of cases, follow very closely the typical text-book picture. It is with the object of emphasising the necessity of early diagnosis and prompt treatment that the following short account has been written. It is based entirely on 23 consecutive cases which have come under my own observation during a period of five years (1915-'20) at the Children's Hospital, Temple Street.

The onset of the condition is nearly always dramatically sudden—a healthy breast-fed infant of about six months

being suddenly seized with an attack of abdominal pain and vomiting. The pain is intense while it lasts, but is intermittent, and in the intervals the child's appearance may be very deceptive; thus it may smile and look pleased at one's attempt to amuse it, until suddenly seized with a fresh paroxysm which causes it to scream with pain. As in other forms of acute obstruction, it is not uncommon for the lower bowel to be emptied at the outset. In a few hours, at most, blood and mucus, unmixed with fecal matter, begin to appear per anum, this appearance being hastened, as a rule, by the inevitable dose of castor oil.

When a child is brought with this history, careful abdominal palpation will reveal a tumour to the right of or more commonly above the umbilicus; in late cases it is to the left. This tumour is sausage-shaped, and distinctly tender on manipulation which, if too vigorous, will evoke a typical paroxysm of pain. It is said that the swelling may often be felt to contract during a pain, but this is, in my experience, extremely difficult to appreciate. If any doubt should be present as to the existence of a tumour, there should be no hesitation in anæsthetising the patient in order to permit of satisfactory examination.

A rectal examination should always be made. If the condition has progressed sufficiently far, the apex of the intussusception may be felt projecting into the lumen of the bowel, like the os uteri externum, and blood and mucus will come away on the examining finger. The apex could be felt in 10 of my cases—in 9 the duration was over 24 hours, and in one of colic type it was 20 hours—so that this is essentially a late sign.

While the general condition of the patient is, in the early stages, often surprisingly good, with the progress of the condition it steadily deteriorates, and the appearance of shock and exhaustion soon become prominent. In very advanced cases the child looks profoundly toxic, the abdomen is distended and tympanitic, and the apex of the intussusception not infrequently protrudes at the anus. Operation at this stage reveals an irreducible and gangrenous intussusception, and whatever the operative procedure, has almost invariably a fatal termination. Successful cases of resec-

tion of the gangrenous mass with immediate anastomosis are published from time to time in medical journals; but they offer no justification of the delay which has rendered such desperate measures necessary.

The diagnosis is rarely a matter of difficulty. The typical onset in a previously healthy child, the passage of blood and mucus per rectum, and the presence of an abdominal tumour are all distinctive when present; and in none of my cases was any one of them absent. The combination of these features in one case should be sufficient to exclude acute colitis or Henoch's purpura; although in the latter case intussusception may occur in the course of the disease, when to the usual features would be added a palpable abdominal tumour. This is a possibility which I should regard as extremely uncommon, but which should be borne in mind.

The treatment of this condition is essentially operative, and must be carried out at the earliest moment. Inflation of the bowel, by air or fluid per rectum, is still, I regret to see, mentioned in reputable text-books. I cannot imagine any circumstance which would justify the employment of such methods.

If we exclude the late cases, with marked toxæmic symptoms, the principal danger attending operation is shock. With the object of minimising this before operation, a small injection of morphia (gr. 1/20) and atropine (gr. 1/150) may be given, which, besides relieving distress, puts the bowel at rest, and materially reduces the amount of anæsthetic necessary. Every effort must be made to get the little patient warm, and the limbs should be wrapped in cotton-wool and bandaged firmly as far as the trunk. The anæsthetic I have used is open ether, but, where practicable, spinal anæsthesia or gas-oxygen are certainly preferable owing to their value in minimising shock. Prolongation of the anæsthetic is highly undesirable, and the operation should be conducted with as much speed as is consistent with gentle and careful work. The abdomen is opened by a 3-inch incision to the right of the umbilicus; it is quicker and easier to separate the rectus fibres in the line of the incision than to displace the muscle as a whole. As the peritoneum is carefully opened free fluid escapes in varying

quantity; it is often abundant and blood-stained. The intestines have a remarkable tendency to protrude from the wound; an occurrence which it should be the assistant's principal duty to prevent, as it may be very difficult to return them to the abdomen afterwards. Should they escape, too much time must not be wasted in the attempt to replace them, but they should be protected with sponges wrung out of hot saline until the completion of the operation, when, by a little extra anæsthetic, they may be more readily returned. With two fingers in the wound the tumour is easily discovered and hooked up to the surface. In large intussusceptions this may be impossible, and in these cases reduction should be begun within the abdomen by expressing the apex of the intussusception backwards along the colon, until a part is reached where the bowel can be drawn into the wound. In all cases it is essential that the terminal part should be reduced by the aid of sight, as otherwise one cannot be certain that reduction is complete. As the cæcum is reached, reduction in all but the earliest cases becomes increasingly difficult, the ileocæcal valve being especially resistant. It is a good plan, at this stage, to squeeze the tumour firmly in the hand for a few moments to empty it of blood, when reduction may be facilitated; too vigorous squeezing must be avoided, as the œdematous bowel splits easily under tension, and reduction may be only accomplished at the expense of numerous tears in the peritoneal and muscular coats.

In the ileocæcal type, reduction is complete when the ileocæcal fold and appendix appear; in the ileo-ileocæcal the apex is in the ileum some inches from the valve, and special care must be taken to continue reduction along the ileum until it is complete. Neglect of this precaution is the probable explanation of the so-called early recurrences after apparently successful reduction. The bowel should now be carefully inspected for rents, which must be sutured with fine silk or linen thread; and as a routine measure it should be palpated for a possible polyp or inverted Meckel's diverticulum. Neither of these was present in any of my cases, but they have been found and successfully removed by others. Finally all exposed intestines are douched with hot

saline, gently replaced and the abdomen closed. In early cases the abdominal wall is sutured in layers; in later cases through and through stitches of stout silk are used for the sake of speed. Various measures have been advised with a view to preventing recurrence, such as suturing the cæcum to the parietal peritoneum. No recurrence took place in any of my cases, to my knowledge, but one of them had six weeks previously been successfully operated upon by a colleague for intussusception. I am convinced that true recurrence, after complete reduction, is very rare, and that the slight risk of this taking place scarcely justifies the extra time spent in its prevention.

After the return of the patient to the ward, the foot of the bed is kept elevated, the bodily heat is maintained, and saline is administered every two hours by rectum. The two great essentials after operation are heat and fluids. As soon as anæsthetic vomiting ceases small quantities of fluid are given by mouth, and if this is well borne, the mother is allowed to nurse the child. It cannot be too strongly emphasised that starvation in these cases is fatal; and the early restoration of the infant to its natural diet and environment I regard as of great importance. The bowels usually move spontaneously on the second or third day, and aperients are as unnecessary as they are harmful. The first stool is frequently dark from the presence of altered blood, which need cause no alarm. The critical period is the first 24 hours, when shock is most severe; after that it is wonderful how very little disturbance babies suffer from the operation, if we exclude the occasional anæsthetic, bronchitis or bronchopneumonia, which are the only serious complications likely to be met with after that period.

Analysis of 23 Consecutive Cases

A.—Age Incidence.

Under 1 year—20 cases—average 5.7 months—died 4

Over „ „ — 3 „ —ages $1\frac{3}{4}$, 4, 9 yrs.— „ None

B.—Mortality.

Total cases—23—died 4—mortality=17.3%

Excluding 1 gangrenous case=14%

C.— <i>Duration before Operation.</i>	Total.	died.
Under 24 hours ...	16 ...	0
24-36 „ ...	3 ...	2
Over 36 „ ...	4 ...	2

D.— <i>Operative Procedure.</i>	Total.	died.
Reduction, with or without suture of tear in bowel wall ...	20 ...	3
Reduction + appendicectomy ...	1 ...	0
Resection + lateral anastomosis ...	1 ...	0
Resection + artificial anus ...	1 ...	1

E.—*Causes of Death.*

Total 4 cases—3 died of shock within 24 hours after operation, 1 of bronchopneumonia.

In one of the shock cases there had been anæsthetic collapse during the operation, requiring prolonged artificial respiration; another was practically moribund (gangrenous case) at time of operation.

F.—*Complications after Operation.*

1 case vomited round worms—recovered.

1 case burst wound on 7th day, extruding intestine which was returned under anæsthetic and wound resutured—recovered.

1 who had measles on admission developed bronchopneumonia and otorrhœa, but recovered. This child, a girl aged 10 months, had an enteric intussusception which could not be completely reduced, and resection (of 4 inches) with lateral anastomosis was required; the recovery was all the more remarkable.

G.—*Type of Intussusception.*

Enterocolic 20 (ileocæcal and ileo-ileocæcal).

Colic 1.

Enteric 1.

Unknown 1.

The distinction into ileocæcal and ileocolic I regard as of no practical importance—but it is of the utmost importance to recognise that the intussusception may begin in the ileum some inches from the ileocæcal valve (ileo-ileocæcal), if incomplete reduction and inevitable early recurrence are to be avoided.

ACTION OF OXIDISING FERMENTS.*

By WALTER G. SMITH, M.D., Ex-President, R.C.P.I.

LET us, in the first place, consider for a moment the forms and sources of oxygen which are at our disposal. They are four in number:—

1. Molecular oxygen: the oxygen of the atmosphere. Its formula is O_2 , or, graphically, either $\overset{+}{O} = \overset{-}{O}$, or $O \overline{\text{---}} O$

For it is held by chemists that oxygen can function in either of two valencies, *i.e.*, as diad or tetrad, and that the atoms are held together by electrical forces.

The doctrine of valency is not finally settled, and still bristles with difficulties. The present view is that chemical valence is reckoned as the chemical expression of the number of mobile electrons or free electrical charges upon the atoms. Transference of electrical charges is the key to all acts of substitution in chemistry, whether organic or inorganic (Jones).

Molecular oxygen is not a highly active form of the element, and it is well known that argon and its companions, iodine, bromine, fluorine, gold and platinum, do not directly combine with oxygen.

Hæmoglobin is an oxygen carrier, but oxygen loosely bound in the form of oxy-hæmoglobin is an inefficient direct oxidising agent.

2. Ozone—Formula $O \begin{array}{c} \diagup O \\ \text{N} \\ \diagdown O \end{array}$

It is a condensed triatomic form of oxygen, and is a very powerful oxidising agent.

3. Atomic or ionic oxygen: $\overset{+}{O}$ or $\overset{-}{O}$

It has often been conjectured that the active or nascent state of oxygen represents the gas momentarily in its atomic or ionic state.

For example, if H_2O_2 be added to an acidified solution of potassium permanganate tumultuous effervescence of oxygen

*Read before the Section of Anatomy and Physiology, Royal Academy of Medicine in Ireland, April 15, 1921.

occurs, and the KMnO_4 is reduced. That is, the two oxides interact and liberate molecular oxygen, formed from the atoms of oxygen in the two oxides being in opposite electrical states. And we have the singular phenomenon of each oxide acting as a *reducing* agent upon the other— $5 \text{H}_2\text{O}_2 + 2 \text{KMnO}_4 + 3 \text{H}_2\text{SO}_4 = 2 \text{MnSO}_4 + \text{K}_2\text{SO}_4 + 8 \text{H}_2\text{O} + 5\text{O}_2$. Active oxygen appears to play an important part in the mechanism of action of oxidising ferments in plants.

We are thus led to consider:—

4. Liberation of oxygen from peroxides, inorganic and organic.

It is generally believed, according to Dr. Dakin, that living cells contain labile substances capable of taking up molecular oxygen from the oxy-hæmoglobin of the blood with the formation of unstable peroxide-like bodies which possess marked oxidising properties.

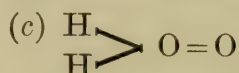
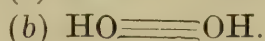
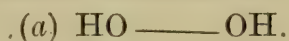
(*Oxidations and Reductions in the Animal Body*, 1912.)

It is quite likely that substances of this type are concerned with the oxidation of compounds in living tissues which are resistant to oxygen under ordinary conditions.

The specific character of certain animal oxidations is most remarkable, especially when phenomena such as those presented by diabetes and alkaptonuria are concerned. In these affections, oxidation of a single readily oxidisable product of metabolism (*e g.*, glucose or homogentisic acid, respectively) may be completely restrained without in the least impairing the capacity of the body for effecting the oxidation of other substances.

The most familiar super-oxide is hydrogen peroxide H_2O_2 , and its oxygen is probably of tetrad valency.

There are three possible formulæ for H_2O_2 :—



The H_2O_2 of commerce is possibly a mixture of (a) and (b), either of which formulæ has more to recommend it than (c).

Commercial H_2O_2 is often strongly acid, owing to free HCl or H_2SO_4 derived from its mode of preparation. Parke

Davis' preparation is only slightly acid, and as a test liquid it is advisable to dilute it with an equal volume of distilled water.

We conclude, therefore, that biological oxidations are concerned chiefly with the ionic and peroxide forms of oxygen, and, only to a minor degree, with molecular atmospheric oxygen.

Oxidation of Organic Tissues.

It is to this branch of the subject that I especially wish to direct your attention, and it is needless to waste time in showing what a dominant part oxygen plays in biological phenomena.

One phase of the subject has given rise to an extensive literature, and it presents several difficult problems which have not yet been completely solved.

I refer to the action of so-called oxidases, a shibboleth often loosely invoked in explanation of certain well-known phenomena.

It is not easy to get clear ideas on this matter from the text-books, and my object in this communication is three-fold, viz.: to clarify my own mind; to attract the interest of the members of the Academy to a difficult and perplexing topic; and to indicate the intimate relations which subsist between animal and vegetable physiology.

All attempts at complete explanation of this phenomena may be regarded, at present, as tentative and provisional.

Over and above direct oxidation by means of molecular oxygen, or by ozone, as exemplified in numerous cases in inorganic and organic chemistry, we have to deal with phenomena of a different order in relation to organic life.

Here we meet with a mechanism whereby inert oxygen is "activated" and acquires enhanced powers.

This mechanism is carried out through the agency of catalysis. A catalyst is a substance which, in minimal quantity, accelerates, *i.e.*, alters the rate of, chemical change without itself necessarily appearing in the final product.

Now most of the processes going on in living structures are performed through the medium of enzymes, which may be briefly defined as the catalysts produced by living

organisms. Physiological chemistry is largely catalytic chemistry, and most enzyme reactions are hydrolytic in nature. There are very many kinds of enzymes which differ from each other in their chemical behaviour, and in the specificity of their action, *e.g.*, 10 enzymes are recognised in yeast.

Enzyme processes and reactions fall into two chief categories:—

- (a) Many of them are hydrolytic, *i.e.*, water is either taken up or eliminated, *e.g.*, those concerned in the digestive functions. Many of these are specific in their action.
- (b) A large number represent an oxidising mechanism, less specific in action, and to this group I will now invite your attention.

In order to simplify matters as much as possible, my remarks will be distributed under three headings, *viz.*:—

- (1) The browning of vegetable tissues.
- (2) Colour reactions with guaiacum or other aromatic reagents.
- (3) Theory of the processes involved.

Browning of Plant Tissues.

Darkening of sap pressed from plants is a well-known and common phenomenon. This can be brought about by various agencies:—

- (a) Action of the vapour of chloroform, and some other volatile liquids.
- (b) Action of tyrosinase on tyrosin, *e.g.*, potato, bean.
- (c) Auto-oxidative processes.

Browning is a frequent occurrence, and is met with in some of the largest natural orders, *e.g.*, umbelliferæ, labiatæ, and compositæ, while it is rare, or absent, in other orders, *e.g.*, cruciferæ.

A few simple experiments will demonstrate these points.

I show you a Portugal laurel leaf which has been exposed to the vapour of chloroform.

The mottled green and yellow leaf is turned a dark chocolate brown.

The chloroform injures the vitality of the cells and so

allows of physico-chemical changes which do not occur in normal fresh tissues.

Potato is similarly affected.

But potato also contains another ferment, tyrosinase, as is easily shown.

Here is a slice of potato which has been treated with a small quantity of tyrosin. Note the brown colour produced by the action of the enzyme tyrosinase, which exists in the potato and bean.

The action of tyrosinase is not to be confounded with the oxidising ferments present in most plants, as evidenced by the blueing of guaiacum. Tyrosinase has no action on guaiacum. P-cresol also gives brown with tyrosinase.

Now let us turn to the more difficult problem of colour changes induced by oxidising enzymes, and revealed to us by various indicators.

Numerous reagents have been suggested and employed successfully from time to time for the detection of organic oxidation.

Guaiacum resin was the first reagent employed, and is still in frequent use. I am quite aware of its limitations and fallacies, and that it must be employed with caution.

Although I have tested several other reagents, nevertheless, for the sake of simplicity, and through want of time, I will chiefly resort to guaiacum this evening.

Guaiacum resin contains guaiaconic acid, a body which is very susceptible to oxidation with the production of a fine blue colour.

As a colour reagent, the guaiacum resin should be thoroughly boiled with rectified spirit and animal charcoal, and filtered. This tincture keeps well for several days. The treatment with charcoal removes traces of peroxide which are liable to occur in guaiacum resin, owing to impurities or otherwise (B. Moore).

Examples of the blueing of guaiacum by oxidation, direct or indirect:—

Tinct. Iodi.

Liq. Ferri Perchlor.

Vapour of HNO_3 .

The clinical use of guaiacum + H_2O_2 as a test for blood is

extremely valuable as a negative test, and its failure is certain proof of absence of blood.

The positive reaction given by blood is difficult to account for, and there are several fallacies to be guarded against.

The blood test appears to be conditioned by the presence of iron, for the guaiacum test for blood is given by the iron-containing hæmatin, but not by the iron-free hæmatoporphyrin.

In mollusca and crustacea, hæmocyanin, a copper-containing substance, acts like hæmoglobin as an oxygen carrier (Beatty).

Guaiacum is also blued by pus, milk, and extracts of some animal organs.

Before entering upon the discussion of the mechanism of oxidation processes, it will, I think, be convenient to demonstrate some simple experiments which will bring out clearly the chief points at issue.

If a number of plant tissues, or their expressed juices, be tested in regard to two reagents, viz.: hydrogen peroxide and guaiacum, we can readily distinguish three groups:—

- (a) Tissues which do not blue guaiacum, but immediately decompose H_2O_2 and liberate molecular and relatively inactive oxygen. A very widespread phenomenon and one independent of (b) or (c). It is due to enzyme A. (catalase), *e.g.*, alyssum, iris, tropæolum, wallflower, yeast, soybean.
- (b) Tissues which blue directly with guaiacum, *e.g.*, potato, apple, carrot. These contain enzyme B, which may be associated with the catechol group.
- (c) Tissues which do not blue guaiacum until H_2O_2 is also added. This is termed indirect reaction, *e.g.*, alyssum, wallflower, tropæolum, soybean. These contain enzyme B, but are devoid of the catechol grouping.

How are we to account for these singular facts? The argument runs on these lines:—

If some bodies react directly with guaiacum, and others only indirectly, *i.e.*, after the addition of H_2O_2 , plainly

there must be, in the former case, some substance present which is absent in the latter case; and which can be replaced by addition of H_2O_2 .

(a) In the first class, *i.e.*, decomposition of H_2O_2 alone, the reaction is referred to the presence of an enzyme, because the change is nullified by first boiling the tissue.

This enzyme has been unfortunately named catalase, and is the commonest enzyme met with in plants.

In this connection I wish to observe that the inherent difficulties of the subject are exaggerated by a perplexing nomenclature on which authorities are not agreed. The terms employed are more definite than our present knowledge justifies, and, in my opinion, in the existing fluid state of enquiry it is wiser to abstain from crystallising into words concepts which are not susceptible of proof.

The term "catalase" is especially unfortunate because it lays undue stress on the idea of catalysis, an agency common to *all* enzymes, and it has never been proved to be a distinct enzyme. Whatever the body, or bodies, may be, it is not an oxidising enzyme, and the name is absurd and misleading. If it were not that the term "peroxidase" is commonly used in another sense, the word would be quite appropriate and consistent to denote an enzyme that operates only on H_2O_2 . I will simply call it enzyme A.

Other terms in current nomenclature are also vague and confusing, *e.g.*, oxygenase, oxidase, and peroxidase, and we will do well to avoid for the present all such indeterminate words, which assume more knowledge than we possess, and confine ourselves to the simple description of experimental facts.

Catalase (enzyme A) is widely diffused not only in plants, but also in the animal fluids and tissues. Thus, pus and blood, *e.g.*, briskly effervesce on the addition of H_2O_2 ; also fat and meat. Its function in plant life is not well understood.

Organic peroxides are unaffected by enzyme A (catalase).

(b) Tissues that blue directly with guaiacum alone.

This is an oxidation phenomenon, and is often ascribed to a so-called "oxidase" reaction, *e.g.*, potato, horse-radish.

The term "oxidase" was originally supposed to connote

a specific entity, something or other, which had the capacity, in its own right, to activate oxygen when brought into contact with certain substances.

This conception, however, was neither satisfactory nor illuminative, and failed to account for the difference noted above, between direct and indirect oxidation.

The activity of oxidising ferments is checked by many things, *e.g.*, acids, NH_4SH , and coal gas.

Oxidising ferments are absent from the fresh juice of limes, lemons, and oranges, but are easily demonstrated in the crushed seeds of lemon or orange.

This is a significant fact in relation to the dietetic value of lemons and oranges in respect of diseases such as rickets and scurvy (B. Moore).

Fresh milk frequently responds to the guaiacum test, but Swiss condensed milk and glaxo gave negative results with all tests. B. Moore reminds us that this absence of oxidising ferments distinguishes preserved foods from fresh foods.

From this it appears that among "accessory food substances" we should take into account not only the so-called vitamins, but also the group of oxidising ferments.

(c) Tissues which do not blue directly with guaiacum, but give a blue after addition of H_2O_2 .

It is clear that in these cases a third substance must intervene in the reaction.

What is the nature of this third component?

In the current literature it is styled "peroxidase," but I will merely name it enzyme B.

There is some justification for regarding it as essentially consisting of an active colloidal metallic hydroxide of either Fe or Mn, associated with some stable organic colloid (gum, protein, etc.) which protects the hydroxide from aggregation.

This enzyme operates upon both inorganic peroxides and on organic peroxide-like substances—and liberates from them active oxygen which gives colour reactions with guaiacum and other indicators.

The action of an organic peroxide in the living organism is the most feasible hypothesis which will account for the fact that many of the oxidation processes which take place

in vivo can be imitated *in vitro* only by H_2O_2 , *e.g.*, in diabetes, the oxidation of B-oxybutyric acid into acetoacetic acid. Indole is oxidised into indoxyl in the body, but outside the body by H_2O_2 only (Beatty. *Enzyme Action*, 1917).

Glucose may be oxidised within the body to glycuronic acid, while H_2O_2 is the only reagent capable of effecting this change outside the body.

But it will naturally be asked—Where does this peroxide-complex come in, when a tissue, *e.g.*, potato, directly blues guaiacum without the help of H_2O_2 ?

The answer is that, in such cases, an organic peroxide-like substance is developed, which, under the influence of enzyme B, liberates active oxygen and, hence, blues guaiacum.

In the case of potato and pear, Mrs. Wheldale Onslow has carried out some instructive experiments which show that these tissues contain a colourless aromatic grouping which affords the reactions characteristic of catechol (pyrocatechin), *i.e.*, a dioxy-phenol body. When the injured tissue is exposed to the air it undergoes auto-oxidation by the free oxygen of the air and forms an unstable peroxide-like system.

Then steps in enzyme B, which acts upon this peroxide system, liberates from it active oxygen, and so gives rise to colour reactions.

Enzyme B (peroxidase) is extraordinarily resistant to decay, and the ferment has been recognised in samples of wheat over 200 years old. Peroxidase outlasts the power to germinate by 100 years (Beatty).

Not to weary you with further speculations upon an obscure topic, I will endeavour to summarise what appears to me to be our present stock of knowledge, based mainly upon the work of Benjamin Moore, Bayliss, and Mrs. Onslow.

Take first the action between potato and guaiacum as a type.

We can picture to ourselves the chain of events as embracing 5 links:—

(1) Free molecular oxygen of the air.

(2) An unstable auto-oxidisable substance, the precursor of (3).

(3) An organic peroxide-complex formed by action of (1) on (2), *i.e.*, it does not exist preformed in the plant. In a recent paper Mrs. Onslow postulates a distinct enzyme for effecting this change (*Bio-Chem. Journal*, October, 1920).

(4) Enzyme B (so-called peroxidase of authors), which splits off active oxygen from (3) and accelerates the transfer

(5) Of oxygen to guaiacum, or other suitable acceptor.

No. 4, *i.e.*, enzyme B, is the true active catalytic ferment of oxidation.

It will be remembered that most plants contain enzyme A (catalase), which does not blue with guaiacum; effervesces with H_2O_2 , and is not an oxidising ferment, and has nothing to do with the colour reactions.

Now look at the question from another point of view. We have already seen that the cut or injured tissues of various plants are browned on exposure, and, further, that in response to the guaiacum test they fall into 2 sub-classes, *viz.*: those that give a direct blue with guaiacum, and those which do so only after the addition of H_2O_2 .

The results may be thus tabulated:—

I.	II
Turn brown on injury, or exposure to CHCl_3 . An auto-oxidation process.	Do not turn brown.
Give direct blue with guaiacum.	Do not respond directly to guaiacum.
Contain an unstable aromatic substance of the catechol group which produces a peroxide-like substance under influence of a special enzyme. Contain enzyme B (peroxidase).	Are devoid of catechol substances, <i>i.e.</i> , of peroxide-like bodies. Give blue with guaiacum + H_2O_2 .

The inference, then, is that in Class II. the addition of

hydrogen peroxide supplies the place of the missing link of the catechol grouping, which functions as an organic peroxide. In potato, after extraction with cold alcohol (which dissolves the aromatic body), I found that an aqueous solution of the residue gave, when concentrated, green with FeCl_3 , *i.e.*, evidence of the presence of the catechol grouping. It is better, however, to extract the catechol substance with boiling alcohol.

It is quite probable that traces of organic peroxide substances are present in most plant juices.

A direct positive reaction (Class I.) in the absence of added H_2O_2 indicates the presence of traces of organic peroxide.

B. Moore holds that guaiacum resin itself may sometimes contain small amounts of organic peroxide (due to impurities) and can be freed from this by boiling with alcohol and animal charcoal. Hence, guaiacum alone is not always trustworthy, and requires to be checked by other indicators. Potato and carrot can also be freed from natural peroxide by treating in the cold with animal charcoal and filtering (Moore).

To sum up:—

Among the host of enzymes known to occur in plants, the experiments shown this evening have demonstrated the existence of three ferments:—

1. *Enzyme A* (catalase).—The most common, and almost of universal occurrence. Reacts only with H_2O_2 , and is not an oxidising ferment, and liberates molecular oxygen, O_2 , relatively inactive.
2. *Enzyme B* (peroxidase).—Very widely diffused. Reacts with organic peroxides. Varieties: (a) acts on catechol group; (b) acts independently.
3. *Tyrosinase*.—Not so widely diffused. Reacts only with tyrosin or related *para*-compounds, *e.g.*, p-cresol, and gives rise to brown, dark red, or black colours.

Thus we have two tests for tyrosinase:—(1) Forms a dark brown colour with tyrosin; (2) gives dark red with p-cresol.

Here I may digress for a moment to point out that tyrosin, a derivative of phenyl-alanin, $\text{CH}_2\text{CHNH}_2\text{COOH}$, together with its enzyme, tyrosinase, have several points of contact with human physiology and pathology.

Pure gelatin, as is well known, does not respond to Millon's test, owing to the absence of tyrosin, and this is one reason why, in dietetics, gelatin cannot replace protein food.

In pathology, there is good reason to believe that the mutual action of tyrosinase and tyrosin is responsible for various pigments met with under abnormal conditions. As examples, three instances may be adduced:—

1. Melanuria and Melanotic Sarcoma.—(Specimen shown.)
2. Alkaptonuria, of which I have seen more than one case.—This condition is connected with the presence of homogentisic acid, a descendant of tyrosin. (Specimen shown.)
3. Ochronosis, a rare condition, first described by Virchow in 1866, and characterised by dark pigmentation in cartilage and elsewhere. In 1904, Osler reported 2 cases, in brothers, who also exhibited alkaptonuria. (Plate shown.)

Finally, I may remark that Benjamin Moore draws an ingenious and suggestive parallelism in mode of action between hydrolytic enzymes, oxidising enzymes, and the active bodies developed in immune sera.

This conception brings the class of oxidising ferments into line both with the great division of hydrolytic enzymes engaged in the processes of digestion and metabolism, and, with the active bodies in the natural and immunising sera, which combat and offer defence against disease, so that the oxidising enzymes form a connecting link between the other two classes.

In all three classes of enzymic action it is to be observed that three interacting bodies are required. These three are:—

- (a) The substrate upon which the ferment is to act.

- (b) The body which is to be combined, directly or indirectly with the substrate, and which alters its chemical and physiological properties.
- (c) The enzyme, or ferment, which activates the reaction.

Thus, for example, in the case of the immune sera, cytolysins, etc., we have:—

- (c) The enzyme, or ferment, which activates the reaction of the toxic or foreign substance in the serum to be attacked and rendered inert.
- (b) *Combining body* (complement), or thermo-labile substance, in the absence of which the reaction cannot proceed.
- (c) *Catalyst*, the specific immune body, or anti-body, which attacks and disintegrates the foreign cell, and “neutralises” the toxic substances.

The poisons formed by living cells may be termed cytotoxins, and their characteristics remind us of the properties of enzymes. Further, we know that cyto-toxins, quite in the same way as enzymes, induce the formation of specific anti-substances when introduced into the blood. So the formation of anti-toxins is strictly analogous to the formation of anti-enzymes; and anti-toxins have the specific effect of rendering the cyto-toxins to which they correspond inefficacious (Czapek).

A NOTE ON THE HEART IN PREGNANCY AND LABOUR.*

By ROBERT J. ROWLETTE.

THE subject of this paper is of interest to the physician quite as much as to the obstetrician. To the latter, it is true, is likely to fall the responsibility of dealing with obstetric emergencies whose gravity may be multiplied by the co-existence of cardiac disease. To the physician, on the other hand, will fall not only the care of the prospective mother suffering from heart disease, but the responsibility of advising on the difficult points as to whether marriage or pregnancy should at all be permitted.

Before approaching the subject of the diseased heart, it is necessary to ask whether pregnancy in itself makes any physiological difference to the healthy heart. One can hardly doubt that the term "strain of pregnancy" has a real meaning, that the burden of supplying a rapidly increasing tumour with copious blood-supply at the same time as the adjustments of the internal organs are undergoing some disturbance must increase the work of the cardiac muscle. Even the healthiest of females—women or other animals—becomes more quiescent during pregnancy and feels fatigue more quickly than at other times. How much of this disturbance is due to extra work thrown on the heart, and how much to interference with the position of the viscera by the enlarging uterus one cannot tell.

Dyspnœa on slight exertion, for instance, may be due in part to the heart's reaction to exercise being more limited in range, and in part to the activity of the diaphragm being hampered.

There is no doubt that in many cases the heart is displaced as a result of the increase in size of the uterus. The heart is swung upward and outward. This has been shown by *x*-rays. According to Blacker (*a*) such displacement takes place to a greater extent in short, squat women than in tall women. It would be interesting to know whether the latter

*Read before the Section of Obstetrics, Royal Academy of Medicine in Ireland, April 29, 1921.

suffer less of the minor inconveniences of pregnancy—dyspnœa and fatigue, for example—than other women.

It has been very generally held that the normal heart undergoes a certain amount of hypertrophy during pregnancy. On *a priori* grounds one might expect such hypertrophy to take place, but it is difficult to establish it as a fact. Clinical observation may be misled by the displacement of the apex beat, of which I have just spoken, while conclusions based on changes in murmurs or on the appearance of murmurs are not trustworthy, as many other causes besides hypertrophy may be at work. On the other hand, the results of autopsies are not convincing, since in the cases that come to autopsy other causes have been at work which may have caused change in the walls of the heart. An experimental study has recently been made by Herring (b) of the effect of pregnancy in rats upon the size and weight of some of the organs of the body. He found that the weight of the heart, kidneys, and spleen were little altered by the occurrence of pregnancy. On the average the heart of the pregnant animal weighed 4.7 per cent. less than that of the controls. On the other hand, there was a decisive increase in the weight of the liver (27.5 per cent.) and some hypertrophy of the adrenals (12 per cent.).

Mackenzie (c) stated some years ago that his own observations did not lead him to conclude in favour of hypertrophy, although the evidence of others had convinced him. On the whole, one must conclude that hypertrophy, if it occurs, is so slight as to be negligible.

As Mackenzie says, it is not compensatory, in the sense of making a pregnant woman to be as active as before conception.

On the other hand, are there any signs of disordered function of the heart which can be regarded as normal on account of their frequency in pregnant women? Mackenzie says, in reply to this:—"I found a series of changes arise which, though in one sense abnormal, might in another sense be considered as incidental to the pregnant state. These conditions were:—

- (a) Limitation of the field of cardiac response
- (b) Changes in rate and rhythm of the heart.

- (c) Dilatation of the right side of the heart.
- (d) Tendency to œdema of the lungs.
- (e) Tendency to overfilling of the veins of the legs.
- (f) The occurrence of marked pulsation in the veins of the neck."

He notes too that the first of these, the limitation of the field of cardiac response, begins in the very early months of pregnancy, long before the bulk of the uterus calls for any increased action of the heart. The dilatation of the right side of the heart is shown both by the extension of cardiac dulness towards the right and by the frequent occurrence of some degree of pulmonary œdema. This is fairly common in the late months of pregnancy, its most frequent physical sign being fine crepitations at the base of the lung. It is Mackenzie's opinion, therefore, and the facts on which he bases it are open to us all, that pregnancy frequently puts such a strain on an undiseased heart as to produce signs and symptoms of definite disturbance of function.

How important such disturbance may be when we have to deal with a diseased heart we have next to consider. For many years, following Angus MacDonald (*d*), who in 1877 published a monograph on the relations of heart disease and pregnancy, the gloomiest views were held of the prognosis in cases of association of these conditions. Of the cases of heart disease in pregnant women that came under MacDonald's notice no less than 60.7 per cent. died as the result of pregnancy or labour. With such a figure unquestioned for years, it is little wonder that physicians and obstetricians gave very decided advice to such women suffering from heart disease as consulted them against undergoing the risks of pregnancy and marriage. But many women undertook these risks against advice, and while some no doubt suffered in consequence, others did not. Again, a great many more women did not seek advice, happily ignorant of the risks of their cardiac condition, and comparatively few of them suffered. In the light of later observations, one must conclude that in MacDonald's observations only cases of severe heart disease were noticed, and in all probability many cases of heart disease without obvious or compelling symptoms had escaped notice. At a later date

Fellner (*c*) showed that in Schauta's clinic, six out of every seven cases of heart disease had been unnoticed, and nevertheless the mortality was only 3 per cent. He established a more rigorous scrutiny of patients in the clinic for the discovery of heart disease, with the result that among the first 900 cases recognised as heart disease there was only 1 death. The mortality, therefore, among cardiac cases in Vienna would appear to be about half the normal mortality in the Rotunda. One can hardly, therefore, regard Fellner's observations as exact. He must have classed as suffering from heart disease many patients who had no organic disease of the heart. If every pregnant woman who presents a murmur is to be regarded as suffering from organic disease, one will arrive at strange results. Nevertheless, Fellner's observations furnish a useful corrective to the pessimism engendered by MacDonald. In truth it is impossible from statistical data to arrive at any accurate conclusions as to the prognosis when heart disease is complicated by pregnancy, unless one could have first the assurance that every observer had the same views as to what constitutes organic valvular disease. To show how various are the conclusions arrived at in different clinics, let me quote (after Hirschfelder (*f*)) the percentage mortality as published by eleven observers:—Lubinsky 60, v. Leyden 55, Wessner 49.3, Schlayer 48, v. Guerard 34, Jess 31.5, Wiesenthal 12.5, Lwoff 12, Schneider 7.1, Gusserow 6, Müller 3, and, as already stated, Fellner 0.1. Even if there were a general agreement, prognosis based on statistics is of very little use, unless corrected radically by consideration of a particular case.

We may, however, look at the mortality from heart disease in pregnancy (with labour) from another point of view, by asking whether among the deaths occurring in connection with child-bearing heart disease is frequently found. I have gone over the mortality tables of the Rotunda Hospital for the eleven years 1905-1915. In these tables notes are given of every individual patient who died. I find that 46,204 women were delivered, with 168 deaths. In 11 of these deaths the heart was concerned. In 7 of these (those occurring in the intern department)

the diagnosis was confirmed or established by autopsy. The causes of death in these 7 cases were:—

(1) hemiplegia occurring in course of acute rheumatism and acute endocarditis, (2) uræmia in a patient with chronic endocarditis and nephritis, (3) acute dilatation of heart without any valvular lesions, (4) fatty degeneration of heart muscle, (5) do., (6) mitral stenosis, (7) fatty degeneration. In the four extern deaths the causes, judged on clinical grounds, were:—(1) mitral stenosis, (2) chronic endocarditis with acute dilatation, (3) chronic endocarditis and chronic nephritis, (4) chronic endocarditis. It will be noticed that heart conditions concerned only 6.54 per cent. of all the deaths in the practice of the hospital, and that death associated with heart disease occurred in only 1 of every 4,200 women delivered.

We have it is true no means of following the after-history of patients when they have left the hospital, and it is possible that a certain proportion of patients were broken down by the strain of pregnancy and labour and that some of them died subsequently as the result thereof.

The hospital records do not give any information of the cardiac condition of the general run of patients treated or admitted, and therefore one cannot form any view of the case mortality.

One cannot but believe, however, that out of 46,204 women there must have been a very large number of cases of heart disease, and that only eleven fatalities occurred in the practice of the hospital is proof that the great majority of patients with heart disease passed with safety through the risks attendant on child-bearing.

Dr. N. M. Falkiner has been so kind as to inform me that of the total number of deaths registered as associated with pregnancy and child-bearing in Ireland 1.7% in the years 1901-10 and 1.3 in 1919 were assigned to heart disease; in England and Wales 4.42 were so assigned in 1919.

So much as regards the general outlook in regard to the occurrence of pregnancy in patients suffering from organic heart disease. The real problem for each of us is, however, whether a particular patient is likely to stand the strain with safety. Here we have to consider two points—the

nature of the organic lesion, and the condition of the heart to meet demands made on it. It is the great merit of Mackenzie's teaching that he has emphasised in regard to heart disease in general the greater importance of the second consideration, a point, by the way, which I think was never entirely overlooked in Dublin teaching.

As regards the nature of the valvular lesion there is general agreement that mitral stenosis is the most serious for a woman undertaking the responsibility of pregnancy. The tendency to dilatation of the right side of the heart, with the unpleasant accompaniment of pulmonary œdema is greatest in case of this lesion. There is the added danger of cerebral emboli, to which accident was due one of the Rotunda deaths: Next in order of gravity is aortic regurgitation, which, however, is rare in women of child-bearing age, and then mitral regurgitation.

More important, however, than a localisation of the lesion is the judgment of the heart's function. I have quoted Mackenzie's observations to show that minor disturbances of cardiac function cannot be regarded as abnormal in pregnancy. Of grave signs, cyanosis on slight exertion is one of the most important. Graver still are the ordinary signs of failing compensation—increasing dyspnœa, cyanosis, enlarged liver, general œdema.

Blacker, indeed, questions whether pregnancy hastens failing compensation, and it is true that sudden failure rarely occurs during actual labour. It is obvious that the earlier in pregnancy compensation fails the more serious the condition. The question arises whether in view of progressively failing compensation labour should be terminated. On this point there is great difference of opinion. One should certainly, in the first instance, use every means to restore compensation other than terminating the pregnancy; but if, in spite of treatment, function steadily gets worse, one has no choice. One must, however, remember that the induction of premature labour itself imposes a considerable strain on the system.

In the case of a woman seeking advice as to the wisdom of undertaking the risks of pregnancy there is now a fairly general agreement of opinion. If she has and has had good

compensation she may fairly face the risks. If she has failure of compensation or has had frequent attacks of failure of compensation, pregnancy should be forbidden. Moreover, if in a previous pregnancy there has been any serious breakdown, future conception should not be permitted. Mackenzie defines these rules so clearly that I may close this note with a quotation from him:—

“ 1. When there is a distinct evidence of failure of compensation, or when the patient is liable to frequent attacks of failure of compensation, pregnancy should be forbidden.

“ 2. With fair compensation, if there should be paralysis of the auricle, as evidenced by the presence of a diastolic murmur and the absence of a presystolic murmur, or of a continued irregularity of the pulse, or of a jugular pulse of the ventricular type, pregnancy should be forbidden.

“ 3. With fair compensation, with a mitral murmur systolic or presystolic in time, with the apex beat within the nipple line, and close to the left ventricle, the patient may undertake the burden of pregnancy.”

The answer to the question of the permissibility of marriage and pregnancy will, therefore, depend on a careful estimation of the condition of the heart, not so much as regards its valves as its function. If a heart is performing its function without interruption over a term of years it will in all probability meet the strain of pregnancy with success and safety. If it has failed, it is likely to fail again.

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- (a) *British Medical Journal*, 1907, Vol. i.
- (b) *British Medical Journal*, 1920, Vol. ii.
- (c) *British Medical Journal*, 1904, Vol. ii.
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- (e) *Monatschr. f. Geb. u. Gyn.*, 1901.
- (f) “ Diseases of the Heart and Aorta,” 1913.

A METHOD OF INDUCING LABOUR.

By GIBBON FITZGIBBON, M.D., Master, Rotunda Hospital,
Dublin.

ABOUT nine years ago I wanted to induce labour in a case for contracted pelvis and left some gum-elastic bougies for the purpose with the nurse the night previous, instructing her to put them to soak in biniodide solution over night, and to give them a short boil the next morning. This was done, and when I came to do the induction I found the bougies all softened and sticky so as to be quite useless. I wanted to proceed with the case, and having a 30-inch No. 22 stomach tube with me I had it boiled and introduced it into the uterus. Labour started in a few hours, and since that time I have never used any other method for inducing labour in private. During the past eighteen months I have adopted the stomach tube for induction of labour in several cases in hospital, and have never found it to fail in any case where it was used.

The tube used is a No. 20 to 24 soft rubber tube 30 inches long; the hard type lately placed on the market is not suitable. At the operation the patient is placed in the dorsal cross-bed position and the vulva and vagina cleansed and douched. A posterior speculum is introduced to expose the cervix and the anterior lip of the cervix held with a forceps. The end of the tube is passed into the cervix and the tube gradually pushed in, until it is all introduced into the uterus. It will then be found to have coiled itself in front of the presenting part in rings about 3 inches in diameter, and is left so until labour starts and is well established. When the os is half dilated or more the tube can easily be removed. When introducing the tube it may be found that after about four inches are introduced the tube refuses to go further. If this occurs giving the tube a slight twist on its long axis while pressing inwards or changing the direction of pressure, without withdrawing the part already in, will start the tube going in again. It is due to the tube not bending at first that the difficulty arises. Once the tube bends it continues to do so and coils itself quite easily. In the last case treated in the

hospital labour came on in three or four hours and progressed quietly and rapidly, so that when the patient began to complain the head was found to be in the vagina. When the baby was born the tube came away with the body of the child. This case was a multipara at the 36th week of pregnancy, and is the only case where the tube was not removed during the first stage.

I think the advantages of the tube over bougies are:—

1. Greater ease and certainty of sterilisation.
2. Practically complete absence of risk of rupturing the membranes.
3. In the uterus it is confined to the lower uterine segment and so avoids the possibility of disturbing the placenta and carrying possible infection up to the region of the placenta.
4. It is as stimulating as the bougies; in all probability it is more so, as it is all in the lower segment, and exerts a slight elastic pressure from its coiled position.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

Diseases of the Skin. A Text-book for Students and Practitioners. By J. M. H. MACLEOD, M.A., St. Andrew's, M.D., Aberdeen; F.R.C.P., London. Royal 8vo. Pp. 1,307. 23 illustrations in colour and 435 in black and white. London: H. K. Lewis and Co., Ltd. 1920.

OVER 1,300 pages, royal octavo, devoted to diseases of the skin and costing £3 10s. 0d., may at first sight appear excessive, but Dr. MacLeod's text-book contains no redundancy. It represents the fruit of many years of careful compilation and ripening experience. It can hardly be challenged as the finest British treatise on dermatology in existence.

The book is divided into two parts—general and special. Part I.—an excellent introduction to the science of dermatology—is divided into chapters dealing with the anatomy, physiology, pathology, etiology and bacteriology of skin diseases followed by an exposition of the general principles of diagnosis and treatment.

To those familiar with Dr. MacLeod's previous handbook it is hardly necessary to say that the early chapters, viz.: those on anatomy and pathology, are excellently written and beautifully illustrated. Most of the illustrations—many of them admirably coloured—are produced from original drawings by the author, and all are models of what such illustrations should be.

The chapter on etiology is admirably concise, without, however, leaving out any matter of importance. Dr. MacLeod rightly emphasises the necessity of observing the general laws of hygiene, laws too often forgotten by the inexperienced dermatologist. The uses and abuses of water and soap are discussed in an eminently sane way. We think perhaps a word of warning might have been added on the frequent habit among the poor of using forms of soap on the face which were never intended for the purpose.

In considering the general principles of treatment much emphasis is laid on the importance of rest of body and rest of mind. There can be no doubt as to the value of this view. We can vividly call to mind one instance where a troublesome skin disease resisted for six months the skilful treatment of two eminent dermatologists only to vanish completely and permanently in the first two days of a holiday free from care and anxiety.

Most physicians will fully endorse the views put forward as to the efficacy of the special health resorts. The paragraphs dealing with hormones are distinctly stimulating.

We are in entire agreement with the author's well-balanced views on the question of idiosyncrasy to *x*-rays, but are inclined to question the view that no harm can be done by giving a B-tint Sabouraud dose of *x*-rays with a very soft tube.

In Part II. individual diseases are considered separately. Dr. MacLeod adopts an etiological basis of classification. Although the present state of our knowledge leaves such a classification far from complete, there can be no doubt but that it is by far the most satisfactory and helpful basis. In Chapter 9, on congenital anomalies of the skin, the term *nævus* is employed in the continental sense to denote non-vascular as well as vascular conditions. Chapters 10-14 consider cutaneous affections due to cold, heat, sunlight, *x*-rays, radium and local irritants. These are followed by chapters devoted to affections caused by streptococci, staphylococci, fungi, bacilli, protozoa (syphilis only) and animal parasites. Next we come to a number of chapters in which are described diseases and conditions which in the present state of our knowledge can only be classified objectively, from the appearance of their lesions, and amongst them we have Chapter 24 on drug eruptions. This, we think, might surely have been included among those of certain etiology. Again we do not understand why Chapters 32 and 33 are included among others which evidently follow an anatomical arrangement treating of affections of the blood-vessels, hair and hair follicles, sebaceous glands, sweat apparatus, lips and mouth. The remainder of the book is concerned with neoplasms of the skin followed by a chapter

on tropical diseases. An appendix of useful formulæ, etc., and a well-prepared index complete the work.

The reader familiar with Dr. MacLeod's other works will expect to find the effects of heat and cold admirably treated, nor will he be disappointed. We were interested to find that for trench foot, hot air, steam and wool wrappings are recommended. Our own experience rather suggested that heat merely aggravated the pain, without apparently hastening cure. The chapters on occupational dermatitis is wonderfully concise and full of carefully-compiled information.

The chapter on tuberculosis is also masterfully well-ordered in its classification of disease and treatment alike, while that on syphilis is especially satisfactory. Dr. MacLeod classifies syphilides into early, intermediate and late groups. Although, as is pointed out by the author, these divisions are purely arbitrary, yet they undoubtedly make for simplicity, and do away with much of the difficulty associated with the old water-tight primary, secondary and tertiary stages. In regard to prognosis and treatment much sound advice is offered. Not the disease alone, but the patient's whole condition must be taken into account.

As an example of careful classification for purposes of differential diagnosis, we find nine points of difference enumerated between psoriasis and its luetic mimic. None of these nine are in any way superfluous.

In general, the references to the literature throughout the book are very complete, but here and there we find omissions. Thus in connection with monilithrix, Walter Smith, who was the first to describe the condition, is not mentioned.

In conclusion, we can but express our respectful admiration for this excellent book. Methodical in its classification, lucid in exposition, admirable in its sound pathology and apposite, well-executed illustrations, it is perhaps in its treatment that it makes its strongest appeal. This is everywhere thorough and concise, and full of the teaching of the sound physician who ever recognises the necessity for considering not only the disease, but the general condition of his patient.

W. G. HARVEY.

Syphilis and Venereal Diseases, for Students and Practitioners. By C. F. MARSHALL, M.D., M.Sc., F.R.C.S., and E. G. FFRENCH, M.D., Ch.B., F.R.C.S., Edin., Lieut.-Col., R.A.M.C. (retired). Being the fourth Edition of "Syphilology and Venereal Disease." London: Baillière, Tindall and Cox. 1921.

THE collaboration of men of such literary ability and great clinical experience as Dr. Marshall and Lieut.-Col. Ffrench leads one to expect a very valuable and useful production. This expectation is fully realised in this work which, in a thoroughly practical manner, covers the whole field of venereal diseases. Since the publication of the third edition in 1914, there has been a great advance in our knowledge of these maladies. To meet this and bring the present edition up to date, the whole book has been revised and much new matter added, especially in the sections dealing with treatment. The addition of many illustrations and some very fine colour plates greatly enhances its value and attractiveness.

The clear descriptions and excellent illustrations of practical details of technique will be greatly appreciated by all practitioners who have to treat these diseases.

The authors are to be congratulated on having presented so comprehensive a study of their subject, and yet being able to keep within the bounds of one small volume.

G. P. M.

Medico-Tropical Practice. By GILBERT E. BROOKE, M.A., L.R.C.P., D.P.H., Chief Health Officer, Straits Settlements, Government Medical Service. "Pocket-Book" Series. Second Edition. Charles Griffin and Co., Ltd. 1920. Sixty-one illustrations. Pp. 522.

THIS second edition marks a great advance in the diagnosis and treatment of tropical diseases. It is a reliable and comprehensive statement of the many aspects of the cases which the medical man working in the tropics and elsewhere may meet.

Chapter I. deals with tropical environment, and gives a lot of useful information to a beginner which is not found in the usual text-book.

Chapter III. on the morphology of the blood. We would like to see Hayem's fluid, mentioned as a diluting fluid, and in the differentiation of leucocytes a description of transitional cells stated to be of some importance in chronic malaria.

A very useful clinical contrast is given between amœbic and bacillary dysentery, but in the late war higher doses than 10 cc. of anti-dysenteric serum were usually given.

A very excellent and detailed description of the trypanosomes is given, and in Chapter XI. a good tabular differentiation of the plasmodial infections. We would recommend Giemsa stain to be included, and if one may venture a criticism on an excellent chapter, it would be to omit in future editions the description given of the method of making Leishman's stain, as the stain already made up is so widely available.

We note that the author does not recommend intramuscular quinine in malaria, and we would have appreciated, especially in this country, a little more about chronic malaria.

We miss in the treatment of bilharzia intravenous injections of antimony tartrate, which was published in July, 1919, and is giving such excellent results.

The chapter on cholera is exceptionally well written and full of detail.

In the chapter on cerebro-spinal fever we are of opinion that the symptoms might be given in more detail, and that the paragraph on prophylaxis might be curtailed with advantage.

There is a very useful chapter on various tropical skin diseases with suggested prescriptions, and the book includes a description of the methods applicable in routine clinical pathology.

In pancreatic investigation in this chapter we do not notice any reference to diastase in the urine.

On the whole, the book is of a very convenient size, well arranged, printed clearly, and one that is to be recommended to all students of medicine. The illustrations are apt, but the microscopic stool pictures could be easily improved. The work reflects great credit on both author and publisher.

ABSTRACTS OF CURRENT LITERATURE.

SURGERY.

WILSON : *The diagnostic significance of Jacksonian Epilepsy.* " Journ. Am. Med. Assoc.," Vol. 76, No. 13, p. 842.

JACKSONIAN epilepsy does not always mean a definite focal disease of the motor cortex though such a lesion must always be considered. The causative conditions may be tabulated as follows : (1) neoplasm of motor cortex ; (2) lesions other than tumour of the motor cortex ; (3) tumours in parts of the brain remote from the motor cortex ; (4) toxic conditions ; (5) myoclonic type of epidemic encephalitis ; (6) the so-called reflex epilepsy ; (7) hysteria ; (8) idiopathic epilepsy. Many cases of Jacksonian spasm are due to neoplasm of the motor cortex, and this condition must be definitely excluded before treatment on medical lines is adopted. The lesions of the cortex that may be associated with hemispasm are—(1) subdural hæmorrhage ; (2) meningo-encephalitis ; (3) localised meningitis ; (4) depressed fracture ; (5) cerebral abscess ; (6) cerebral softening secondary to vascular disease ; (7) foreign bodies ; (8) multiple sclerosis ; (9) angioma. Cerebral tumours remote from the cortex may produce typical Jacksonian attacks, and the author cites or quotes cases of subcortical growths pontine and cerebellar tumours in which apparently true Jacksonian fits occurred.

In the case of subtentorial tumours the resulting internal hydrocephalus was in all probability responsible for the cortical symptoms. In cases of this type the importance of excluding or localising an intracranial tumour is emphasised. When Jacksonian epilepsy occurs late in the history of patients with brain tumour it is of little or no localising value. In diabetes, uræmia, acute infectious diseases and alcoholism unilateral spasms sometimes occur. Four cases of idiopathic epilepsy in which attacks of hemispasm occurred are cited and the author believes that such an association of idiopathic and Jacksonian epilepsy is not at all uncommon.

ADAMS A. McCONNELL.

FISHBERG, M. : *Discernment of intrathoracic Neoplasms by aid of Diagnostic Pneumothorax.*

OWING to the accidental wounding of the visceral pleura, with resultant pneumothorax, while tapping a pleural effusion secondary to carcinoma of the lung, an *x-ray* showed clearly a hydro-pneumothorax of the right side and a tumour adjoining the mediastinum. It is suggested that with proper precautions, this method may be found of use in diagnosing these cases. Where there is no effusion the technique is simple. Several hundred cubic centimetres of nitrogen or air are injected into the pleural cavity

by using any of the standard apparatus and a manometer. In cases where an effusion has occurred the fluid is first withdrawn with a Potain apparatus. The amount of gas allowed to flow in varies with the condition of the patient and the reading of the manometer. As much as 1,000 cc. of air may be allowed to flow in. The manometer pressure should not rise above 10 cc. of water. There is a short description of three cases so treated by the author.

R. A. STONEY.

Empyema Thoracis: An analysis of 56 cases in the Indiana University Hospital. "The American Journal of Medical Sciences." March, 1921.

THE author's conclusions are—Mortality, 7.1 per cent. Most cases have followed pneumonia, 20 per cent. had familial tuberculosis, but a negligible percentage gave personal history of pulmonary predisposition. Lagging or retraction of the affected side, dulness, distant or absent breath sounds, and absence of fremitus, were the outstanding physical signs. In view of the fact that "closed methods," (not including aspiration) would seem based on a faulty conception of the pathologic physiology of the chest in empyema, the treatment of acute cases in this series has been palliative aspiration until cicatricial exclusion of the general pleural cavity has made rib resection the operation of safety and choice. Sixty per cent. of these cases have had rib resection, usually the seventh or eight in the mid-axillary or posterior axillary lines. The average post-operative residence in hospital has been four and a half weeks, the posterior axillary line cases leaving the hospital first. In chronic empyema the aim has been cavity obliteration by sub-periosteal rib-resection and at times parietal pleura extirpation. The mortality in this plan was 9 per cent. in 11 cases. There is nothing very new in these conclusions, and the only criticism to be offered is that the opening in the posterior axillary line is not the best situation for drainage, and that the results would probably show improvement if the scapular line were chosen instead.

R. A. STONEY.

MEYER, W. : *Fundamental Principles of Thoracic Surgery.* "Medical Record." April 9, 1921.

THE author lays down the following three rules, which he considers fundamental in the surgery of the thorax :—1. The avoidance of the acute pneumothorax—acute operative collapse of the lung—during the operation. 2. The avoidance of acute post-operative pneumothorax resulting from our efforts to render harmless by drainage the exudate which is the response of the pleural leaves to exposure and manipulation. 3. The avoidance—as far as it is possible—of everything that might favour the development of a post-operative pneumonia. The first rule necessitates the use of one of the four methods of differential air pressure which are now at our disposal

for this purpose. The second rule entails the use of airtight thoracic drainage, at least for the first two or three days, to give the lung the chance for proper distention, and also to favour the formation of adhesions between the costal and pulmonic pleura. In order to avoid post-operative pneumonia the author makes the following suggestions :—

1. The selection of the proper type of differential pressure apparatus for general anaesthesia in the given case.
2. Carefully planned preparation against possibly arising difficulties, by placing within easy reach the devices required to meet them.
3. The more frequent and persistent use of regional and local anaesthesia during the entire operation in order to avoid the aspiration of intrabronchial contents into the lung tissue proper.
4. Thorough clearing of the bronchial tree by aspiration, at the hands of a trained bronchoscopist, just before the operation. Such pre-operative preparation, of course, refers only to patients suffering from chronic, non-tuberculous, suppurative lung disease, *i.e.*, patients that have become accustomed to the introduction of the bronchoscope.
5. Further experimental work on cocaineization of the pneumogastric nerve or nerves, above as well as below the aortic arch.

R. A. STONEY.

BRATTSTRÖM (Sweden): *Results of Operation for Breast Cancer.*

"Acta. Chir. Scand." 1920. liii., pp. 146-153.

BETWEEN January, 1905, and January, 1916, 212 cases of carcinoma mammae were operated upon, with one primary fatality, due to pulmonary embolism. 198 cases were followed up, of whom 63 have remained free from recurrence at the end of 3 years (31.8 per cent.). 31 of these patients have been free from cancer recurrence for a period of 10 years or more. Of the 63 patients with a three years' "cure," 17 had actual metastases in the axillary glands at the time of operation, as shown by microscopical examination. [These figures show a higher percentage of good results than any published German clinic, and are surpassed only by American published results. Halsted 35 per cent., Deaver 34 per cent., over a three year period.—W.D.] Of the 63 patients free for a three year period, 54 (25.5 per cent.) were free at the end of five years. [Mayo's figures for the five year period were 29 per cent., and Deaver, 26 per cent.—W.D.].

Brattström makes several interesting observations on recurrence; six of his cases returned with cancer in the other breast; in two cases metastases were found in the brain, and only in 11 cases, were skeletal metastases demonstrated. He points out that metastasizing skeletal cancer is of long duration, and has a remarkably good prognosis for spontaneous fracture. The primary operative mortality is well below 1 per cent.

WM. DOOLIN.

DELORE and GUILLEMINET (Lyons): *The value of the two stage gastrectomy.* "Revue de Chir." 1920. No. 2, pp. 123-143.

WHILST claiming no originality for the procedure adopted, the authors make a strong plea for the two-stage operation in selected cases. It is particularly advisable in cases where well-marked pyloric stenosis is present. In such cases, the emaciated and frequently anæmic state of the patient calls for a minimal trauma; behind the pyloric obstruction is usually to be found a dilated stomach, with walls thickened from œdema, and of weak peristaltic activity. Such a wall affords poor material for suturing, needles cut through, and bleeding is frequent, both of these accidents favouring fistula formation, post-operative hæmorrhage, and localised peritonitis. Such sequelæ may be fatal, and may be largely eliminated by a preliminary gastro-enterostomy; this, by relieving the pyloric obstruction, affords rest to the stomach; at the second operation, the patient is better nourished, and the gastric wall is in better condition; post-operative shock and acute gastric dilatation are accidents unknown after the two stage procedure.

The indications are not very frequent. Of 129 gastrectomies between 1910 and 1920, the authors utilised the two stage procedure on 33 occasions, with 2 deaths; of the 96 single stage operations, 16 died; there is thus a difference of 10 per cent. in the primary mortality rate.

The primary gastro-enterostomy should be placed as far from the pylorotomy area as possible. The interval between the two operations should not exceed 3 weeks; the gastrectomy used by the authors was the Billroth II. type.

The two stage gastrectomy is not without certain disadvantages, which are given due consideration; patients who feel much improved by the preliminary gastro-enterostomy, may withhold their consent to the more decisive second step; a cancerous tumour (*à marche rapide*) may have grown so rapidly that at the second intervention its extirpation is impracticable; during the second operation, the gastro-enterostomy opening may be damaged; and, owing to the double opening of the abdominal wall, there is the greater likelihood of subsequent hernia formation through the scar. Where possible, a one stage procedure is preferable; but there exists a large number of cases where the two stage procedure is distinctly the method of choice; the authors detailed account of their 33 cases demonstrates the utility of the latter procedure admirably.

WM. DOOLIN.

MÉTRAUX (Lausanne): *End-results of Simple Gastro-enterostomy for ulcer of stomach and duodenum.* "Revue méd. d. l. Suisse rom." 1920, xl. 9. pp. 569-622.

M.'s article, based as it is on an analysis of 210 cases, is a plea for the straightforward gastro-enterostomy in the treatment of ulcer. The published results are of all the greater interest seeing how many surgeons are to-day in favour of more direct dealing with the

ulcerated area. Further, at the last French Congress of Surgery, Duval's conclusions in favour of the Balfour operation and of annular resection of the ulcer fell short of the opinions of others for whom a pylorogastrectomy was the method of choice.

In view of the undeniable gravity of this last method, and having due regard to the simplicity of the gastro-enterostomy, Métraux believes that there is an element of danger in widening the field for these more extensive operative procedures; his study of the results of gastro-enterostomy, as practised in Roux's clinic at Lausanne, leads him to the direct conclusion that there still remains a large number of ulcer cases for whose cure gastro-enterostomy alone will suffice.

M. takes up all the objections which have been alleged against gastro-enterostomy, subjecting them to critical examination; in his opinion, such objections have been exaggerated, even the most serious, *i.e.*, the risk of later malignant degeneration in the ulcer; this latter occurrence he found to have taken place in only 2 per cent. of Roux's cases.

210 cases were reviewed by M. at a post-operative period varying from 8 months to 21 years. All were examined clinically for gastric function, as well as by *x*-ray. The percentage results are very satisfactory, *vide* following table:—

Operated...	...	210		
Cured	...	189	=	90 per cent.
Mediocre results	...	14	=	6.6. per cent.
Deaths	...	7	=	3.3 per cent.

Four of the deaths were due to cancerous degeneration; one to an anastomosis-ulcer, one to recurrence, and one probably to vicious circle-formation.

Classifying the ulcers by their site, those on the greater curvature gave 100 per cent. cures, of the duodenum 96 per cent., surfaces (ant. and post.) 92 per cent., pylorus 90 per cent., lesser curvature 86 per cent.; ulcers of the cardiac end were of least satisfactory prognosis, giving only 71 per cent. of cures. WM. DOOLIN.

BRADY, LEO: *Tuberculosis of the Kidney in Women*. "Johns Hopkins Bulletin," Vol. 32, No. 359. January, 1921.

IN 60 per cent. of cases of tuberculosis of the urinary tract the lesion has been in the right kidney, in 35 per cent. in the left kidney, and has been bilateral in 5 per cent.

In 88 per cent. of cases dysuria and polyuria were the first symptoms, in 10 per cent. hæmaturia.

Thickening and tenderness of the portion of the ureter palpable on vaginal examination was present in 32 per cent. of patients, and this sign is of great help in the early detection of cases of renal tuberculosis.

Three women on whom simple nephrotomies were done all did badly.

Comparison of nephrotomy and nephro-ureterotomy shows that

although the ultimate results are the same the post operative sinus heals more rapidly when the latter operation is performed. This, therefore, would seem to be the operation of choice when the patient's condition warrants a prolongation of the anæsthetic.

These observations are based on 77 cases. The diagnosis was confirmed in all either by the urinary or cystoscopic findings or by examining the kidney when removed. A. B. CLERY.

PARISI, A.: *The high frequency current in vesical tuberculosis.*
 "Journ. d'urologie." Tome ix. No. 5. p. 341.

THE vesical symptoms which usually accompany renal tuberculosis are unequally affected by nephrectomy. Sometimes they disappear on the very day the kidney has been removed, in which case their cause is probably a reflex irritation from the kidney, and not any definite organic lesion in the bladder. In the great majority of cases there is an amelioration in the symptoms for a time, but frequent and painful micturition reappears and persists for some time. These cases show circumscribed tuberculous lesions in the bladder; spontaneous cure is known to take place, but it is, perhaps, indefinitely retarded. In other cases the cystitis remains nearly stationary without affecting the general condition which in all patients after nephrectomy continues to improve in the succeeding months. To this class belong the prolonged cases of cystitis in which there is profound involvement of the vesical walls, and above all the association of a secondary infection with the primary tuberculous process. In some quite rare cases, however, operation is followed by an aggravation of the vesical troubles. Statistics do not agree as to the proportion of patients in whom nephrectomy is finally curative or in whom intractable cystitis remains. There are fewer cases of prolonged cystitis in private patients after nephrectomy than in those belonging to the hospital class, a fact which shows the influence of general treatment in the cure of tuberculous cystitis. Excluding tuberculosis of the second kidney and of genital tuberculosis the most important factor in intractable cystitis is evidently the degree of vesical involvement at the time of the nephrectomy. If secondary infection has occurred treatment will be prolonged. The stump of the diseased ureter may keep up a rebellious cystitis for a long time by discharging tuberculous débris into the bladder at intervals. If, however, *early* nephrectomy is practised as it should be the ureter does not require removal and will not cause vesical trouble afterwards.

The author treated 21 cases of persistent tuberculous cystitis with the high frequency current of the d'Arsonval type. In 13 the pain completely disappeared, in 5 it was diminished, and in 2 it persisted. Of these last cases one had not been operated on, and one had a stump of the ureter discharging into the bladder. The effect on the frequency of micturition ran parallel to that on the pain. Pus disappeared from the urine and the vesical capacity was increased. Complete relief amounting to cure is claimed in 10 cases. The

technique of the application which differs in some important details from that employed in vesical tumours is given in full. A complete history of each case is appended.

ADAM A. McCONNELL.

DANDY, WALTER E.: *Hydrocephalus in Chondrodystrophy*. "Johns Hopkins Hospital Bulletin," Vol. 32, No. 359. January, 1921.

SKULLS examined show tribasal synostosis resulting in foreshortening of the base, brachycephaly and receding of the bridge of the nose. Kaufmann showed this to be due to lack of development of the basal bones as of those of the rest of the body. Post mortem examinations of the brain in chondrodystrophy are singularly lacking. The only one found was on a man of 75 and showed ventricles dilated with clear fluid.

The large head has, in the author's cases, been shown by ventriculography to be due to hydrocephalus. The head in one case had stopped growing, and the air, which was injected into the lateral ventricle, was demonstrated by x-ray in the terminals of the subarachnoid space—the cerebral sulci. As air, and, therefore, cerebro-spinal fluid, had passed from the ventricles, through the foramina of Luschke and Magendi, to the sulci where it was absorbed, the progress of hydrocephalus must have been arrested. Thus it appears that the development of hydrocephalus in achondro-plasia tends to cease spontaneously. When untreated a defective brain seems inevitable.

Dandy has no opportunity of observing the progress of hydrocephalus, but it may be possible, by the newer methods of intracranial study, to ascertain the cause and avert the disastrous sequelæ.

The size of the head and, therefore, the grade of hydrocephalus seems to be proportionate to the severity of the dwarf phenomena in chondrodystrophy.

A. B. CLERY.

SWARTZ and DAVIS: *Action of Mercurochrome-220 on the Gonococcus*.

"Journ. Am. Med. Assoc.," Vol. 76, No. 13. p. 844.

IN a paper abstracted in these columns (March, 1920), Young, White and Swartz pointed out the potency of mercurochrome-220 as a germicide in the urogenital tract. The present authors have made special experiments with the gonococcus, which have demonstrated that mercurochrome-220 has a powerful germicidal action against this organism in vitro, but that it is not a panacea for all gonococcal infections. When solutions are allowed to stand there is a rapid decline in their germicidal power. Therefore, they should be prepared freshly for clinical use. The gonococcus is about forty times as susceptible to the action of mercurochrome as is the bacillus coli.

[The results obtained by the reviewer in cases of pyelitis and cystitis warrant the conclusion that this drug or some one allied to it will occupy an important place in the treatment of such conditions.]

ADAMS A. McCONNELL.

ABRAHAMSEN (Copenhagen) : *Separation of the upper femoral epiphysis, with special relation to coxa vara.* "Acta Chir. Scand.," 1921, Vol. liii., Fasc. iii., pp. 230-264.

ATTENTION was first drawn to this condition in 1898, by Poland, in England, and by Sprengel, in Germany, both indicating the liability to coxa vara as a late result of the lesion. Whilst many orthopædic surgeons, in addition to the static and traumatic varieties, recognise an idiopathic type, Lorenz vigorously denies its possibility, ascribing all such cases to previously existing but unrecognised traumatic conditions. As a result of his observations of 14 cases, all between the ages of 10-17 years, Abrahamson inclines rather to the Lorenz point of view, whilst admitting that the contention is difficult of proof.

Detailed histories of four cases, with *x-ray* plates, are given, where an epiphyseal separation, due to apparently insignificant injuries, was early recognised by *x-ray*; owing to the relatively simple type of violence, and apparently innocent early signs, the condition is most often quite unrecognised at the start, being diagnosed as "coxalgia," or "simple hip contusion."

In very young children, a forcible hyper-extension at the hip, with the limb in the abducted position, may produce the lesion (Poland); in older children, a direct fall on the great trochanter is the more common causal injury. With an incomplete separation, the symptoms are often not very pronounced; pain may be altogether absent, but the limb drags somewhat on walking; shortening is scarcely perceptible; abduction may be limited, and a fixed pelvis is observable on passive movements; a position of slight external rotation, with limitations of abduction and internal rotation, is characteristic. When the separation is complete, the usual signs of a fracture of the neck of the femur are present. The usual displacement of the articular surface is downwards and backwards. The femoral shaft taking up a contrary position of adduction, external rotation, and moderate flexion.

A. emphasizes the advisability of early radiographic examination of the hip joint in all cases when, following on a fall or injury, there persists either pain, limp, or dragging of the limb. Both hip-joints should be radiographed in the Lauenstein position, *i.e.*, with femur in a position of mild abduction and external rotation, to get the most accurate information as to the relation of epiphysis to shaft. Should such an examination demonstrate an epiphyseal detachment, the limb and pelvis should be encased in a plaster spica (Lorenz), the leg being in a position of moderate abduction and internal rotation, which position alone allows of an anatomical replacement of the epiphysis. This cast is kept on for at least eight weeks; on its removal, a further period of four weeks is devoted to massage and regenerative exercises, before the limb is allowed to bear the weight of the body.

Abrahamson's conclusions on the subject may be briefly summarized as follows: epiphyseal separation of the femoral head

may be produced by minimal trauma, even by brusque movements at the hip; the first contusion may detach the articular surface, and a second cause its displacement; symptoms may be very slight, and, in certain cases, be reduced to a simple dragging of the leg; there is not always pain; it is probable that a true idiopathic type of coxa vara does not exist, but that the cause is to be found in an unrecognised epiphyseal separation; an *x-ray* examination is necessary with the slightest symptoms of hip injury, even if the patient has only a slight limp; a radiograph taken in the Lauenstein position will give accurate information in doubtful cases as to the smallest displacements, which would not be demonstrable with a simple ventrodorsal photograph. In all cases, recent or otherwise, an attempt should be made to replace the head and to apply a Lorenz bandage. If one neglects to replace the articular surface, further pronounced deformity is produced with increase in growth.

WM. DOOLIN.

BLOCH (Paris, "Rev. de Chir." May, 1921, pp. 417-434) contends that the majority of alleged epiphyseal separations and femoral neck fractures as diagnosed in infancy are in fact misinterpretations of *x-ray* findings; that, in any event, such lesions are due, when present, not to minimal, but to severe, degrees of trauma, as in the adult. The standard guide to diagnosis should not be a radiographic, but a clinical sign, viz., inability of the patient, when lying down, to lift the extended leg up from off the bed. Any epiphyseal detachment, or unimpacted fracture of the neck, renders such a feat impossible. Further, many genuine fractures of the femoral neck in children may be looked upon as pathological; the subject is rachitic; B.'s thesis is a reversal of the usual belief; he attributes the fracture to a pre-existing rachitic coxa vara, not the coxa vara to a pre-existing traumatic condition in the femoral neck.

WM. DOOLIN.

CADENAT (Paris): *Radical cure of Femoral Hernia*. "Revue de Chir." 1920, No. 2, pp. 105-121.

JUDGING by the numerous papers which have appeared since 1913, there is not the same unanimity of opinion amongst surgeons as to the method of closure of the femoral canal as in the case of the inguinal tract. C. points out that the essential principles underlying the two operations are identical, viz., high ligation of the sac, and effective closure of the canal. Ligature of the femoral sac may be effected by either the femoral or inguinal route. With an adherent sac, the latter is not always feasible; he, therefore, prefers to follow up the sac from its crural aspect, having first divided the lowermost fibres of Poupart's ligament in a vertical direction. To effect a good closure of the crural canal, it is necessary to bring down and maintain in position without tension one or two musculo-aponeurotic "curtains"; to achieve this, the following modification of Hartmann's technique has been devised:—

1. An obtuse-angled incision, upper limb running parallel to the inner half of Poupart, and, then the lower limb, vertically down the thigh on inner side of femoral swelling; the angle of the incision lies about one finger's breadth to outer side of pubic spine, right over the neck of the sac. This incision affords a good exposure of Poupart's ligament and of the sac.

2. A two-centimetre *vertical* incision of the lower border of the external oblique aponeurosis, immediately within the line of the femoral vein; from the lower end of this, a longitudinal incision of the lowest fibres runs inwards, splitting the floor of Poupart's ligament from its femoral aspect. Retraction of the triangular flap thus formed exposes the muscular lower border of the internal oblique.

3. Exposure of sac; treatment of content; high ligation of neck of sac.

4. A retractor now elevates Poupart's ligament and the floor of the inguinal canal, thus exposing Cooper's ligament on the pectineal aspect of the pubis. With the vein well guarded, three or four looped threads of catgut are passed through Cooper's ligament from its femoral aspect. The apex of each loop is now cut, thus leaving a series of double threads in position; one series of these threads is now passed through the lower fibres of the internal oblique, which is thus brought down and fixed to the pubic bone; the other series is now threaded through the lower border of the triangular flap of the ext. oblique, which is thus fixed in a similar position. A double "curtain" of musculo-aponeurotic tissue has thus been brought down and fixed, to close the crural canal.

The outermost threads are passed as closely as possible to the femoral vein, without actually compressing it.

Of 100 cases of femoral hernia in Hartmann's clinic (Hôtel Dieu, Paris), 89 were in females: 69 on right side, 30 on left, only 1 bilateral. 45 replied to a questionnaire, none had recurrence, 6 months after operation.

C. cites simple closure of the sac, without closure of the crural canal, as giving 29 per cent. of recurrences; closure of sac, plus closure of canal with one curtain only gives nearly 9 per cent. of recurrences.

[C's paper is accompanied by six very instructive illustrations.]

WM. DOOLIN.

NEUBERGER (Vienna): *Intestinal Obstruction following the use of the Murphy button*. "Wien. Klin. Wehschr." 1920. 45. p. 984.

A PATIENT in von Eiselsberg's clinic, who, 13½ years previously had undergone a colo-colostomy, was suddenly seized with signs of subacute ileus. Deep palpation revealed a small tumour in the left hypogastrium. On x-ray examination, a Murphy's button was recognised. At operation, having liberated the transverse colon, which was adherent to the abdominal wall, Eiselsberg discovered a diverticulum, in which was imprisoned the button, and from whence

it made a projecting mass into the lumen of the bowel. It was extracted, and the patient made an uneventful recovery.

Apropos of these findings, N. made a series of enquiries as to the fate of such buttons left in the intestinal tract. As a rule the button is expelled between the 8th and 20th days. All the same, in 371 reported cases, Neuweiler and Dancel found that in only 223 (60 per cent.) cases did the button come out within one month from operation. In 7 cases these observers found the button during subsequent laparotomies or autopsies. Gelpke found the button in situ at autopsies made between 11th and 144th days on 9 occasions. Retarded appearance of the button has been recorded on the 140th day by Thomas, 145th day by Murphy, between 6th and 7th month by Gelpke, at the end of 2 years by Mühsam, and of $7\frac{1}{2}$ years by Hofmann.

Generally speaking the button is well tolerated, but occasionally it gives rise to trouble necessitating re-operation. Thus Kocher removed a button impacted in the pylorus $1\frac{1}{2}$ year after insertion; Lauenstein had to remove one from the afferent loop of a gastro-enterostomy, on the 108th day; after a Billroth II. gastrectomy, Kloiber found a button so firmly fixed in the anastomotic opening that he was unable to remove it; Kelling extracted a button from the stomach cavity $14\frac{1}{2}$ years after gastro-enterostomy. In a young girl who had been operated on for tuberculous strictures of the intestine, Kloiber found no less than 3 buttons, still in position, 8 years after the primary operation. Mühsam has recorded impaction of a button at the splenic flexure.

N. sees in these collected "incidents" the justification for the abandonment of anastomosis by button. WM. DOOLIN.

INGEBRIGSTEN (Christiania): *Entero-anastomosis in the treatment of acute intestinal obstruction.* "Acta. Chir. Scand." 1920. Vol. liii. Fasc. ii. pp. 105-127.

For the relief of an acute intestinal obstruction due to adhesion formation, the method of choice is the performance of lateral anastomosis between a distended loop of gut and a collapsed loop, placed as close as possible to the site of obstruction: prior to the junction, the distended loop should be emptied by trocar-puncture.

This axiom is enunciated as a result of personal experience in 7 cases, of whom 6 recovered, and continue to enjoy full health. In all, the adhesion formation took place at the site of a former peritoneal focus of inflammation, viz.:—

Female, 42 years: 6 days' obstruction, previous strang. femoral hernia. Recovery.

Female, 67 years: 4 days' obstruction, previous strang. hernia. Recovery.

Male, 71 years: 2 days' obstruction, 4 previous attacks of "colic." Recovery.

Male, 18 years: 10 days' obstruction, previous appendicular abscess. Death.

Female, 40 years : 7 days' obstruction, recent pelvic appendix abscess. Recovery.

Female, 43 years : 36 hours' obstruction, recent general peritonitis. Recovery.

Female, 34 years : 15 days' obstruction. Ileo-cæcal volvulus. Resection. Secondary obstruction. Recovery.

The following alternative methods of treatment are duly considered and their merits compared with those of the method advocated :—

1. Enterostomy. Personal experience small, but discouraging. The fistula is always made, so to speak, "on the blind," the operator not being sure at what exact area of the intestinal tract he is making his opening ; it may be too high ; is difficult to close ; fraught with too many risks to be safe ; recoveries by this method he looks on as lucky "flukes," rather than as foreseen acts.
2. Resection of adherent loop, or anastomosis ? The answer depends on the condition of the arrested loop ; if the bowel wall is not viable, one must resect ; otherwise, one need not.
3. Liberation of adhesions. One cannot detach dense adhesions in the "acute" abdomen without causing some damage to the bowel wall. Unless the adhesions are of fairly recent formation, limited in extent, and easily accessible, in full view of the operator, their detachment is decidedly risky. In two such cases, the author has had successful results by simply freeing the adherent coils. But it is of vital importance that the process of detachment does not impair the integrity of the bowel wall ; in doing so, one runs the risk of spreading a focus of infection which has hitherto been walled off, or one may effect damage to the bowel wall, not at first observable, but culminating two or three days later in a fœcal fistula, or perforation-peritonitis. To avoid such accidents, it is best to respect the adhesions, and short circuit the interrupted intestinal flow ; by so doing, one affords an opportunity for rest and deflation to the affected loop ; the resultant improvement in the local circulation means repair, with absorption of inflammatory products, and, in favourable cases possible disappearance of the adhesions which were the cause of the obstruction.

One possible objection arises to this method of procedure ; after the anastomosis has relieved the obstructive crisis, the adhesions may not disappear, and such patients then must carry the risk of another future obstruction. The risk is there, but must not be exaggerated, in view of the fact that of 7 patients operated upon, 6 recovered, and continue in full working health, with, so far, no ill after effects.

WM. DOOLIN.

BÉRIEL, L. : *What can one ask of surgery in true tumours of the brain ?*
 "Lyon Médical." Tome 79. No. 24. p. 1009.

THE surgery of intracranial tumours ought to be curative, but in practice it is often exploratory and ends with a simple decompression,

hence the physician has but a vague conception of which cases to submit to the surgeon, and frequently fails to submit them at all. Authors of text-books group all intracranial tumours together asking first if there is a tumour present, second, where it is situated, and third, what is its nature. The essential thing for the practitioner to decide is the nature of the growth. Intracranial tumours ought to be classified in two groups:—1. Tumours of the brain properly so-called, those that are real neoplasms of nervous tissue—the gliomata. 2. Fibrous tumours originating from the meninges. These groups represent different maladies and ought to be considered separately. The glioma born of nervous tissue is incorporated with it and the whole brain reacts to its presence. This characteristic dominates all its history. Clinically it is not a localised affection—it is a disease of the brain and presents itself with all the signs of a general cerebral reaction. The conditions to be considered in the differential diagnosis are not so much other varieties of tumour as cerebral syphilis, toxæmias of alcohol or lead, uræmic vascular accidents or diffuse inflammatory re-actions, epilepsy, migraine or the psychoneurosis. The key to the diagnosis is hypertension—increased intracranial pressure. On the other hand tumours of the fibrous type are distinct from the nervous tissue, the brain appears to atrophy according as they progress and invade it. Localising signs furnish the outstanding clinical features of the case. Hypertension exists but rarely, and is then due to accidental circumstances. Prognosis and treatment depend on the recognition of these two groups. Fibrous tumours often exist for a long time and only precipitate a fatal issue by the accident of their environment. One can hope for and expect their complete ablation and total cure. Surgery can usually accomplish this, and ought to be given the chance. With the glioma the case is different, it is impossible to hope for enucleation, the attempt at enucleation is absolutely contra-indicated. [The author evidently speaks of infiltrating gliomata for *some* gliomata have been removed and the patients have survived for years.—A. A. McC.] Operation should be strictly palliative. In order to determine the presence or absence of hypertension, the pressure of the cerebro-spinal fluid is taken with a manometer after lumbar puncture [The danger of lumbar puncture in cases of suspected intracranial growth must not be lost sight of.—A. A. McC.] When the diagnosis of a glioma is made the practitioner asks what he may hope from surgery. He can only hope for temporary relief, but that relief is sometimes for a lengthy period, and he is not justified in denying it to his patient.

In one case a craniectomy—without opening the dura—was performed over the site of the tumour in 1914, the patient was so much relieved that he went through the campaign in Alsace in spite of a cerebral hernia. He survived for 22 months after the operation. Considerable extrusion of the tumour had taken place through the craniectomy defect. Other similar cases are cited. The practitioner must form an estimate of the operative danger and compare it with

the spontaneous evolution of these tumours. In the author's cases two operative deaths were due to the attempt to perform a curative operation when only a palliative one was indicated. Five other cases survived in comfort for periods varying from 3 to 22 months. Eight similar cases which were not submitted to operation died without relief of symptoms in the course of a few weeks. When the surgeon cannot cure it is his duty to afford relief. The site of the growth, its supposed size and its varying symptoms are secondary considerations to be weighed by the physician and applied by the surgeon, but the question for the practitioner to decide is whether he will send his patient for relief or not. Relief surgery *can* give.

ADAMS A. McCONNELL.

YOUNG, H. H.: *The radical cure of tuberculosis of the seminal tract.*

"Trans. Amer. Assoc. of Genito-urinary Surgeons." Vol. xiii. pp. 173-269, 1920.

YOUNG, after an analysis of cases of seminal tract tuberculosis treated at the Johns Hopkins Hospital and after careful examination of the statistics of other writers believes that in the great majority of cases the primary involvement is in the seminal vesicles, or in the prostate, and that the epididymes are secondarily infected. Young agrees with MacFarlane Walker that infection of the testicle takes place in tuberculosis by way of the lymphatics of the cord, and not by the blood-stream. Walker inoculated the anterior urethra of guinea pigs with organisms, and after twelve hours, abundant growth was obtained from the epididymis and a scanty growth from the testis.

The same organisms were found in the vesicles and in the plexus of lymphatics running with the vas. Blood culture was negative. In the lumen of the vas, organisms were few, or were absent. Young found serial sections of the vas deferens showed that the vas itself was comparatively healthy at its prostatic extremity, but that it was surrounded by a thick shell of tuberculous tissue due to lymphatic infiltration. This infiltration died out towards the testis. Section of the testicular end of the vas, showed that though the surrounding lymphatics were comparatively healthy, the mucosa here was infected. "This distribution suggests that the disease is disseminated from the prostate by the lymphatics, and that having encountered in the epididymis a suitable soil in which to flourish, it produces a returning wave of infection in the vas through the agency of secretions."

Clinical evidence supports this conclusion, for (1) tubercular epididymitis is rare, apart from infection of the prostate or vesicle, whereas infection of these structures is often found without epididymal involvement.

(2) The earliest signs of tuberculous disease are found most often at the lower pole of the epididymis.

(3) Tuberculous disease of the testicle is analagous to acute infections produced by extension from the urethra, and usually

differs sharply from a hæmatogenous infection, *e.g.*, the orchitis of mumps.

Treatment.—For the reasons already specified, Young advocates complete excision of the tuberculous seminal tract. He acknowledges that excellent results are often obtained by a less radical operation, but after reviewing the statistics of survival in large series of cases operated at many different clinics, he shows that epididymectomy and castration give a remote mortality which at the end of six years may exceed 40 per cent.

The Operation.—If the lungs are involved this may be performed under local anæsthesia (novocain 1 in 400) supplemented by an occasional whiff of gas, otherwise, a general anæsthetic is used. A U-shaped incision is made, as for perineal prostatectomy; the central tendon and the recto-urethralis muscle are divided, and the membranous urethra and the apex of the prostate are exposed. A prostatic tractor, which up to this point has lain in the membranous urethra, is now advanced into the bladder, where its blades are opened. By its aid, the prostate and seminal vesicles are levered into the wound. The fascial sheet covering the prostate, seminal vesicles, and vasa deferentia is easily exposed when the levatores ani and the rectum have been drawn backwards. This fascia is incised, as a rule, by a V-shaped cut, and is reflected to expose the lateral lobes of the prostate and the seminal vesicles. The central portion of the prostate, lying immediately beneath the urethra, and containing the ejaculatory ducts is left intact. Diseased lobes are removed, and the affected vesicles enucleated.

The ends of the vasa deferentia are caught in long clamps, and the perineal wound is drained and partly closed. The patient is then placed on his back with legs widely separated. An incision is made just below the external ring, the testis is delivered, and the epididymis and vas separated from it, the upper end of the epididymis being divided by a cautery. The vas, which has been exposed to the external ring, is freed, without further dissection, by alternate traction from the groin, and from the perineum. When free, it is drawn out through the groin.

Young has performed this operation fifteen times; only one of the cases is known to have died (from mediastinal tuberculosis one year after operation.) Eight of these cases were operated less than two years ago.

Perineal urinary fistula occurred in 1 case (slight leakage only). Sinuses in groin or perineum was present in 6 cases. Sexual powers were not impaired in the five patients who sent replies on this subject. In 7 cases there was evidence of pulmonary involvement before operation, and 5 had renal tuberculosis, 3 requiring nephrectomy.

A. K. H.

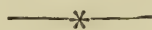
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Original Communications.



LICHEN AXILLARIS, LICHEN ANNU-
LARIS, AND NOTE ON THE
ETIOLOGY OF LICHEN.

By WALLACE BEATTY, M.D., Physician, Adelaide Hospital.

LICHEN AXILLARIS.

*Fox-Fordyce Disease.*¹

Case 1.

MISS E. R., aged 23. Seen in 1906.

She came to me on account of an irritable eruption in both axillæ. I noted "solid pale papules in both axillæ. I punctured two and got no fluid."

She stated that 12 months before she came to me she noticed a rash in the armpits which was very itchy; it seemed to "run," and was said to be weeping eczema.

She was rather pale and delicate-looking, but I found nothing special in her general condition. Functions were normal.

The eruption was limited to the axillæ.

There were a number of small very solid papules, each about the size of large shot. The colour was almost that of

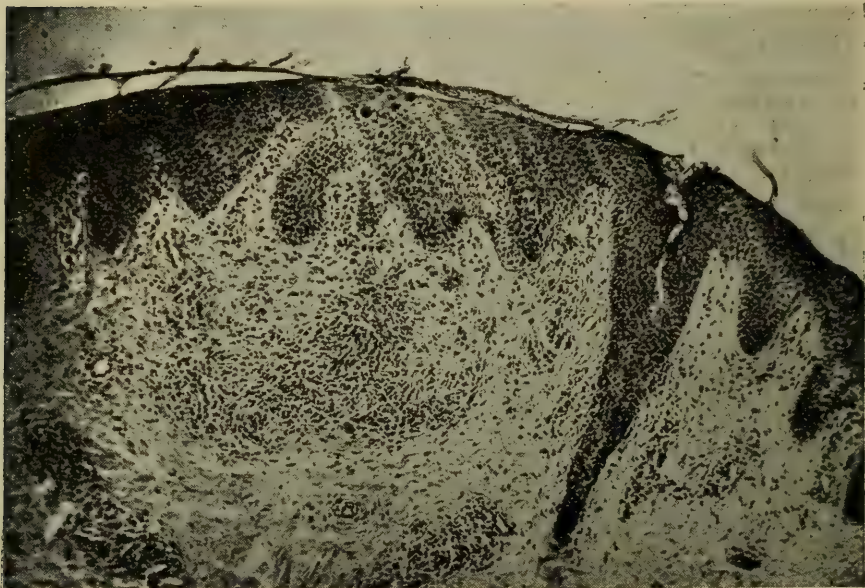
¹ Paper read at the Biological Club, March 22nd, 1921, and Case exhibited.

normal skin. Viewed as a whole the axillary region appeared pale red.

Many of the papules appeared to be connected with the hair follicles. In the centre many hairs were seen. In other papules the hairs were more eccentric, and some papules showed no hairs. A few were centrally umbilicated.

The papules were numerous, close together, but not coalescing, and, when the skin was put on the stretch laterally, were seen to be arranged in lines running antero-posteriorly.

FIG. 1.
(Low power.)



Shows sweat-duct with proliferation of the epithelium around, also cellular infiltration of the upper part of the corium.

There was some sweating, but not profuse.

There was troublesome itching—maddening at times—and a history in the past of disturbed nights therefrom.

Her hands were inclined to perspire.

I was greatly puzzled as to the nature of the eruption; I had never met with a similar case.

Mr. Gordon excised a papule from the lower part of the right axilla. I fixed half in absolute alcohol; half in Zenker's fluid

Before examining the papule histologically, I thought of the following possibilities:—

Chronic folliculitis.—Against this there was practically no redness and no suppuration.

Follicular lichen.—But there were no lesions elsewhere.

Sebaceous adenoma.—But there was no tetangiectases, and the position was unusual.

FIG. 2.
(Low power.)



Shows sweat-duct—epithelium proliferated round sweat-pore.

Sweat-gland adenoma.—I leaned towards this, but I noted many lesions appeared to be connected with the hair follicles.

Leiomyoma.—Only a wild guess!

In the sections of the papule excised I noted:—

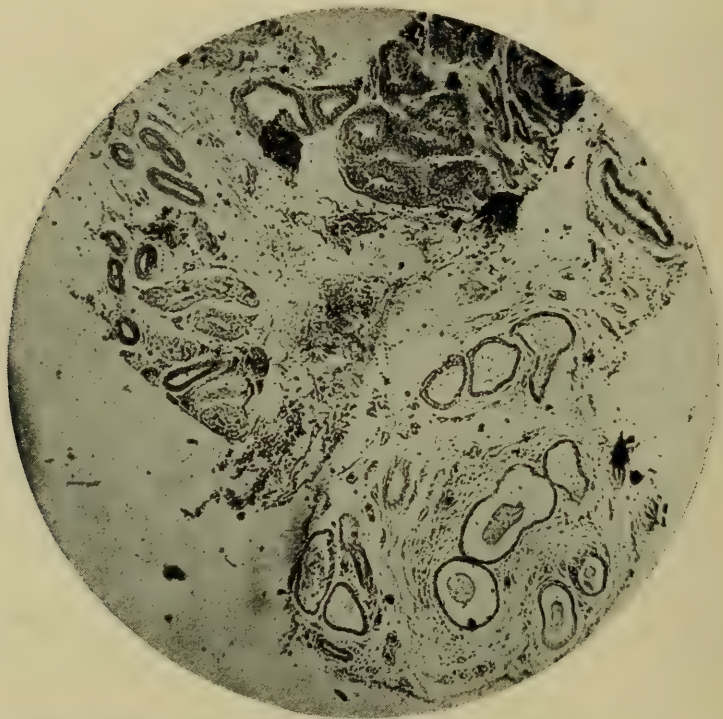
1. The coils of the sweat-glands are, some of them, dilated and contain inspissated secretion, and there is a cellular exudation round the coils, and dilated blood-vessels.

2. There are in places groups of cells in the upper part of the corium not unlike what is seen in true lichen.

3. The epidermis is thickened markedly at orifice of sweat duct, and a horny process is seen dipping into one sweat duct orifice.

See Figures 1 to 6. (Photomicrographs of my sections kindly taken for me in May, 1921, by S. Adrian Stokes.) Examination of the sections appeared to me at the time to

FIG. 3.
(Low power.)



Shows sweat-coils, some dilated, containing inspissated secretion; cellular infiltration around coils.

show that the eruption was a lichen with dilatation of the sweat coils and inflammation round them. Later I labelled the sections spiradenitis or inflammation of the sweat coils.

Case 2.

This case presented itself in the autumn of 1920, and I was at once reminded of the case I have just described.

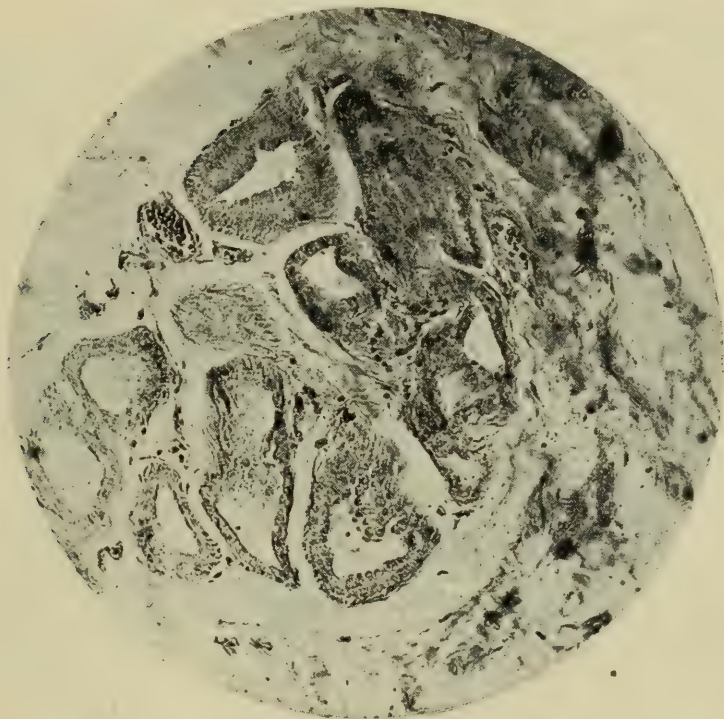
Miss W., aged 22, began to suffer from great itchiness in both axillæ six years ago.

Itching, often keeping her awake at night, came first, the

eruption two or three years later. The areolæ of the breasts became affected about two years ago. Excitement brings on irritation.

She is of nervous nature, but there is nothing very special to note in regard to her general condition. The papules in the axillæ are numerous, firm, pale in colour, some pierced by hairs, some (a few) umbilicated. When the skin is stretched laterally they are seen to run in lines antero-

FIG. 4.
(High power.)



Shows evidence of capillary dilatation round coils.

posteriorly or rather from the front backwards and downwards. The papules are 1 to 2 mm. in diameter. See Figure 7.

The papules on the areolæ of the breast are about 3 mm. in diameter; a few are umbilicated—some are torn by scratching.

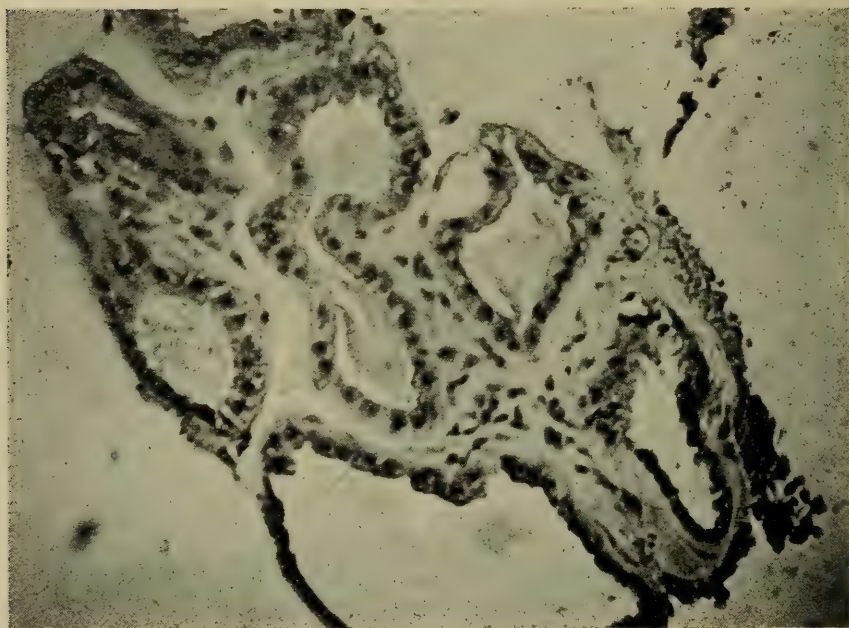
These are the only cases of the kind I have ever met with, and I had not come across in my reading an account of similar cases, until two or three weeks ago, when I saw in March, 1921, number of the *British Journal of Dermato-*

logy among current literature “two cases of Fox-Fordyce’s Disease,” by C. Rasch and A. Kissmeyer.

I quote Dr. W. J. O’D. précis:—

“One case, a female aged 33.—The disease had persisted for 10 years in the axillæ and on the pubic region, and during the later years on the areolæ mammæ. . . . It was very itchy, but the patient was unable to state whether the irritation had preceded the appearance of the skin erup-

FIG. 5.
(High power.)



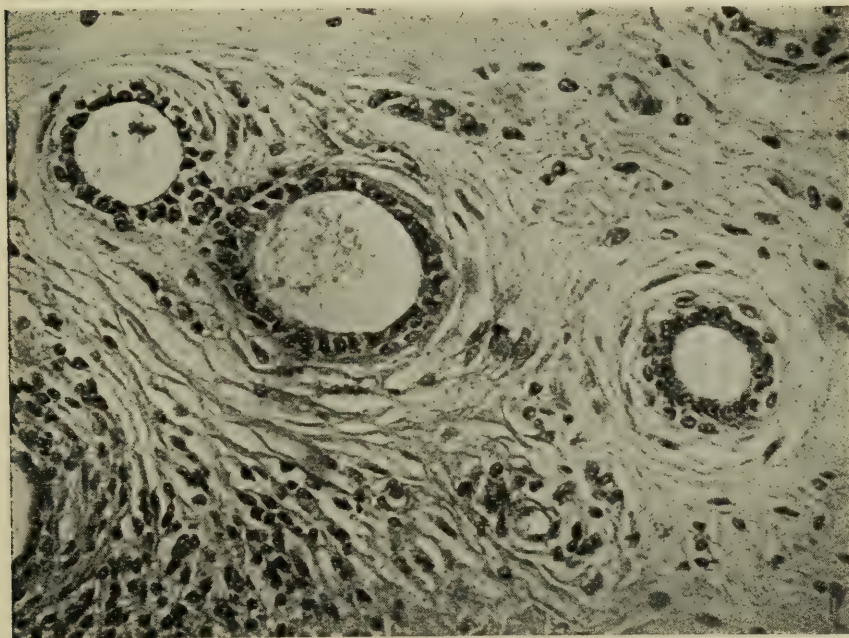
Shows dilated coil, and actively secreting gland.

tion. The lesions consisted of conical firm brown perifollicular papules, from some of which hairs projected. Others showed a slight umbilication, from which a drop of serum could be expressed, or were topped by a small crust. Intense irritation accompanied the affection—no improvement after two applications of *x*-rays.

“Their second case was a female aged 24. The condition had lasted for four years, was accompanied by very severe itching, and had commenced two months after an abortion as a papular affection in the axillæ, on the external genitalia and areolæ mammæ.

“ Microscopical examination of papules from the pubic regions of both cases showed hyperkeratosis, and parakeratosis, a very pronounced acanthosis with downward prolongations of broad epithelial processes, hypertrophy of rete malpighii most pronounced, around the hair follicles and the orifices of somewhat dilated sweat ducts, and around the vessels in corium an infiltration of round cells, with a few mast cells and occasional plasma cells. The authors con-

FIG. 6.
(High power.)



Shows dilated coils, muscular layer of coils, cellular infiltration around.

clude that the condition is probably primarily a pruritus, the site of predilection favouring a secondary infection from scratching. Reference is made to nine cases previously recorded in the literature.”

In Stelwagon’s excellent work on diseases of the skin, I find cases like mine referred to, under the heading of “Chronic Itching Lichenoid Eruption of the Axillary and Pubic Regions.” He writes:—

“Brocq, Fox, Fordyce, Haase and others have reported cases—few in number.” And along with other references he referred to Fox’s cases reported in the *Journal of Cutane-*

ous and Genito-Urinary Diseases, 1902, "Two cases of a rare papular disease affecting the axillary region, by George Henry Fox, M.D., with a report of the histopathology by John A. Fordyce, M.D." The affection appears to have been first carefully noted by them, and hence now it is called "Fox-Fordyce's Disease."

Fox's first case was a woman, 28, unmarried, born in Russia. She came to the New York Skin Hospital, Jan., 1899. The eruption was mainly in the axillary region and had existed for a year. Itching was intense, paroxysmal, robbing her of sleep, and impairing her health. She was thin, and of neurotic temperament.

The eruption was papular; the lesions numerous, small, firm, smooth and rounded. Skin was deeply infiltrated and slightly fissured.

The aggregated papules were of normal colour or but slightly reddened—scratching produced congestion and excoriation.

Over pubic region there was a number of small rounded papules: the pruritus was not so intense as in the axilla. Fox called it a chronic lichenoid eczema.

Treatment was unsatisfactory. After eleven months in hospital the note was "Unimproved."

Fox's second case was a young man, neurotic. Papules were confined to the axillary region. The pruritus was intense.

The histological changes found by Fordyce were:—

(1) Hyperkeratosis involving chiefly the sweat duct orifices, their intra-epidermic portions, and the orifices of the hair follicle.

(2) Consecutive hypertrophy of the stratum spinosum (acanthosis) surrounding the altered sweat ducts and hair follicles.

(3) Mechanical dilatation of coil glands which result in changes in their epithelial lining.

(4) Inflammatory changes of a more or less chronic character in the derma.

The histological findings of Fordyce and mine are very much alike. I, too, have experienced as Fox did great difficulty in influencing the condition by treatment.

Notes on Lichen.

The term *lichen*, used without a qualifying adjective, is the one true lichen, called also lichen planus. Its great character is that the elements of which it is composed are small solid elevations of the skin—papules—and remain solid from start to finish, *i.e.*, till they disappear. They do

FIG. 7.



Lichen axillaris.

not undergo any transformation into vesicles, but their surface may become covered with a scale. Different affections characterised by papules during their entire course are often called lichenoid, or lichen with a special qualifying adjective. There are two rare affections which may perhaps be regarded as varieties of true lichen, on account of their

microscopical characters—one, the rare papular disease of the axillary region just described, the other an affection described by Galloway under the title of lichen annularis.

Lichen Annularis (Galloway).

I have met with two examples. One a young lady with a raised crescentic ivory white lesion over a metacarpo-phalangeal joint. The facsimile of the plate of sarcoid in the *Iconographia Dermatologica*. This was cured by *x*-rays.

The other, a gentleman kindly sent to me by Dr. Drury in April, 1917. Some three years before he was stung on the back of the left hand by a marsh fly (when in England). The hand swelled, became septic; several weeks passed before his hand got well.

About 6 months later the lesions which I am about to describe began.

- The left hand only was affected, that is, the hand that had been septic.

There were three areas of disease:—

(1) A roughly circular area involving the skin over the anterior half of the metacarpals of the middle and ring fingers, bounded laterally by interspaces between middle and index fingers, and ring and little fingers, and reaching anteriorly over metacarpo-phalangeal joints of middle and ring finger to the roots of these two fingers.

The anterior part of this area was made up of solid whitish nodules, forming a semi-circle, convex forwards in front and towards ulnar side laterally. All over the patch were very slightly-raised white angular lichen-shaped nodules, and these in the centre sprung from a somewhat reddened general surface.

The condition resembled Galloway's case of lichen annularis. *B.J.D.*, Vol. II., p. 221.

(2) Another small irregular quadrilateral marginate area was situated at inner side of the hand opposite the metacarpo-phalangeal joint of left little finger.

This was a very typical patch—raised white continuous nodular border. The individual nodules which formed this area were solid and small, pea-sized. The central part of

the area was practically normal. This area resembled somewhat the plate of sarcoid in the *Iconographia Dermatologica*. See Figure 8.

(3) A third small lesion about 1 cm. in diameter was present in skin of dorsum of middle phalanx of middle finger.

Two applications of *x*-rays and the use of salicylic plaster succeeded in removing the lesions.

FIG. 8.



Lichen annularis.

Etiology of Lichen.

The cause of lichen is not yet known. There are three theories:—(1) Nervous origin. (2) Toxic origin. (3) The result of scratching in predisposed subjects, itching being said often to precede the eruption.

The histological characters of lichen seem to me to point strongly to its belonging to the class of granulomata to which tuberculosis, syphilis, blastomycosis, sporotrichosis, etc., belong.

In lichen there are changes in the corium and changes in the epidermis.

In the corium there is a remarkably dense cellular infil-

tration. Small round cells, many probably of connective tissue origin, in the papillary and subpapillary layers, and a most remarkable abruptness in the way this infiltration is marked off from the deeper part of the corium. The deeper part of the corium is normal, except for a few cells round the blood vessels.

In the epidermis there is simply evidences of proliferation in pure lichen, viz., acanthosis, hyperkeratosis, and an irregular thickening of the granular layer, which explains the white striæ often to be seen with a lens on examining the surface of a lichen papule—the so-called sign of the net or network.

The epidermic changes are moderate in extent in acute lichen. In chronic localised lichen they are marked, and there is a considerable thickening of the horny layer with horny processes or pegs dipping downwards into the orifices of the hair follicles, or sweat ducts, or independently of these—this form is called “lichen verrucosus.” In lichen verrucosus constant scratching probably causes the marked epidermic thickening.

Of the three causes mentioned, a pure nervous influence could hardly cause such an anatomical picture—scratching could not account for widespread acute lichen or for the lichen of the mucous membrane of the mouth; so the second cause, toxic origin (perhaps direct microbic influence) remains, and if the anatomical structure may be fairly compared with that of tubercle or some of the other granulomata possibly the finding of a microbe, bacterial or protozoal, is only a matter of time.

Though the cellular infiltration in lichen is usually composed of small round cells, occasionally some plasma cells have been found, and even giant cells. The histology is quite unlike that of ordinary inflammation of the skin; there is no serous exudation into the epidermis, and where wandering cells are found there it would seem to point to an ordinary inflammatory complication.

THE NATURE OF THE INTERNAL SECRETION OF THE PANCREAS.

By W. M. CROFTON, M.D., Lecturer in Special Pathology,
Univ. Coll., Dublin.

An Hypothesis.

IT is no exaggeration to state that the question of the relation of the internal secretion of the pancreas to metabolism is in a state of confusion and still more confused are our ideas of its nature. The object of this essay is to attempt to show that this substance is not, as is usually held, a 'hormone' such as the secretins, thyroid substance, pituitrin, and so on, but is an essential part of a compound ferment by means of which synthesis and hydrolysis, that is, anabolism and katabolism of different food material, is brought about.

It will not be possible for me to give anything like a complete account of all the work that has been done; it will only be possible to give a general outline and to meet and explain the objections which appear hostile to my hypothesis.

Von Mering and Minkowski first showed that the complete removal of the pancreas produced a severe and rapidly fatal diabetes in which there was profound upset of both carbohydrate, fat and protein metabolism. That this was not due to absence of the external secretions (protease, lipase, amylase) was shown by the fact that if a portion of the pancreas is grafted under the skin these metabolic errors constituting diabetes do not occur.

It is to be noted that glycogen entirely disappears from these animals.

There is imperfect metabolism of fats with the production of poisonous fatty acids, and there is a rapid breakdown of the cell proteins with formation of ammonia to neutralise these fatty acids.

Cohnheim showed that if muscle press-juice or pancreas press-juice was mixed with a solution of dextrose little or no sugar disappeared, but that if pancreas press juice was added there was a very marked decrease in its copper-

reducing power, *e.g.*, samples of mixed juice acting on 2% dextrose caused a reduction in its copper-reducing power of .35% to .84%, while the muscle juice alone under similar conditions caused from 0 to 0.021% reduction of this power.

Others failed to get these results, obtaining marked reduction with muscle juice alone, but it was shown by Hall that this was due to the muscles not being properly washed free from blood which contains the necessary substance. Moreover, the suggestion that the reduction was due to microbial action has proved not to be the case, as the experiments were repeated under aseptic and antiseptic conditions. It has been found that the experiment does not succeed if the muscle juice is first heated to 60° Centigrade, while an extract of a boiled pancreas will provide its necessary substance. That is, the muscle substance is, in the language of immunology, heat-labile, while that in the pancreas juice is heat-stable.

The disappearance, then, of the glucose in the experiment is brought about by the interaction of a heat-labile substance obtained from tissue cells and a heat-stable substance obtained from the pancreas.

It was natural to suppose that the copper-reducing power in Cohnheim's original experiment and that of his repeaters was due to the breakdown of the glucose into its elements under the conditions of the experiment. This appears not to be the case. The disappearance of this power has been shown (Levene and Meyer) to be due to the glucose being elaborated into a non-reducing saccharide. According to Bayliss this entirely destroys the significance of the experiment, but it seems to me capable of a simple explanation, *viz.*, that just as in the next experiments to be referred to, it is due to the too great concentration of glucose in the experiment as in the intact body of the concentration of glucose is above 0.2% glycogen is stored in the liver and muscle cells; if it falls below this glycogen is broken down to keep the glucose concentration in the blood and tissue fluids normal—the internal secretion of the pancreas being necessary for both these operations.

Knowlton and Starling using heart-lung preparations showed that a preparation made from a depancreatized dog

had little or no capacity for metabolising glucose unless pancreatic extract were added to the Ringer's solution. On repeating these experiments it was shown that the disappearance of the sugar was due to its elaboration into glycogen in the heart-muscle. The conclusion from the past experiments that the internal secretion had produced hydrolysis of the glucose was therefore abandoned. It is to be noted that the percentage of sugar in the circulating fluid in these experiments was generally above .2%. Clark, however, using a heart-pancreas preparation and taking elaborate care against microbial contamination, has shown that:—

(1) If the pancreas was perfused alone with Ringer-Locke solution, no dextrose had disappeared at the end of four hours. If the heart were perfused alone, 0.7 mg. of dextrose had been used per gramme of heart. If the Ringer-Locke was perfused through both the pancreas and heart nearly 2 mg. per gramme of heart had disappeared. Hydrolysis at the end of the experiment showed that .175 (about) mg. of this disappearance was due to the formation of a polysaccharide.

(2) If the fluid was first perfused through the pancreas for 15-60 minutes there was no utilisation of dextrose, but if the pancreas was then removed from the apparatus and the heart of the same dog substituted and the fluid perfused for 4 hours through it, 2.6 mg. per gramme of heart-muscle was used; 0.6 mg. per gramme of this disappearance was due to the formation of a polysaccharide.

(3) If the pancreatic perfusate was first heated to boiling this marked utilisation did not take place, but it stood heating to 56°C., nor did it take place if the heart was not beating.

(4) If different amounts of pancreas perfusates were added different amounts of dextrose were used, *e.g.*, if 1 cc. were added 1.4 mg. of dextrose was used in four hours per gramme of heart-muscle, and no polysaccharide was formed. If 5 cc. of pancreas perfusate was added nearly 1.8 mg. per gramme was used and .1 mg. per gramme of polysaccharide. If 10 cc. of perfusate was added 3 mg. per gramme was used, and nearly 0.175 mg. of polysaccharide per gramme formed.

The concentration of the dextrose in these experiments was always below 0.5%.

Clark concludes that the substance is of the nature of a ferment.

It is quite clear from these experiments that the pancreas perfusate brings about both an hydrolysis and a polymerisation of dextrose.

Héden has produced similar results in live dogs. Anastomosis was made between the pancreatic vein of a normal dog and the jugular vein of a depancreatized and diabetic dog. The glycosuria almost disappeared, and there was a diminution in the glucose-content of the blood. How important it is that the pancreas secretion should pass in adequate quantity through the liver is shown by the fact that a vascular anastomosis was made between the vessels of part of the pancreas of a normal dog into the circulation of a diabetic dog. There was a reduction of sugar in the blood and almost complete disappearance from the urine only when the venous blood of the pancreas was allowed to pass through the liver by anastomosis with the splenic vein of the diabetic dog.

Internal secretion is necessary for the kidney cells to do their work properly, for Héden has shown that the blood-sugar may scarcely be diminished at all when this action of the kidney ceases owing to the influx of normal blood. This effect on the kidneys may be either decreased permeability of the cells of the capsules, or it enables the cells of the tubules to do their re-absorption work on the glucose in the glomerular filtrate, or lastly and more probably, it may be owing to the fact that in normal animals the circulating glucose has the internal secretion attached to it, and therefore can be properly metabolised. De Meyer has shown conclusively that this internal secretion of the pancreas is necessary for the storing of glycogen in the liver.

We may conclude then from these experiments that for the hydrolysis of sugar a heat-stable substance is produced by the pancreas. If the concentration of the sugar is greater than 0.2% in the blood, it is synthesised into glycogen or excreted by the kidneys. Under test tube conditions, *e.g.*, Cohnheim's experiments, the synthesis evidently only goes

as far as the production of a disaccharide. It must be remembered that in these experiments of Cohnheim's, and I think his repeaters, the concentration of dextrose was unphysiological—that is, was many times more than could occur under normal conditions in the body. They ought to be repeated, using a concentration of 0.2%.

Before leaving the subject of the tissue metabolism of sugar, it is interesting to note that a similar heat-stable substance can be produced for the metabolism of a foreign sugar introduced into the animal system parenterally. It has been shown that if a solution of cane sugar is injected into a dog it is at first rapidly excreted as cane sugar, but very soon the co-ferment is produced, so that it is converted into glucose, which is either hydrolysed or stored as glycogen, or the superfluity of it excreted by the kidneys.

To sum up, it is clear from the foregoing that the tissue metabolism of sugar is brought about by the interaction of two substances—heat labile complement-like ferment and heat-stable immune-body-like co-ferment.

Shaw-McKenzie and Rosenheim have demonstrated in blood and pancreatic extract a similar co-enzyme for the lipolysis of neutral fat. This is thermo-stable, soluble in glycerin and water, soluble in weak, but insoluble in strong alcohol, and is dialysable. If a glycerin extract of the pancreas is made and filtered through muslin and diluted with water, a milky fluid results. If this fluid is allowed to stand a white precipitate settles. On incubating either the precipitate or supernatant fluid separately with fat no lipolysis occurs, but if the two are mixed together a large amount of lipolysis takes place. The ferment in the precipitate is destroyed by heating to 60°C., while the co-ferment in the supernatant fluid stands boiling. This co-ferment occurs in large amounts in blood, as we have seen a similar co-enzyme for glycolysis does. I do not know whether experiments similar to Cohnheim's have been done using muscle press-juice, pancreatic extract and neutral fat as a substrate.

Turning now to the question of the tissue digestion of proteins and their anabolism, have we any evidence that a similar co-ferment is present? I think we have. It is well

known that if any protein antigen is introduced parenterally that a substance not destroyed by heating to 56-60° C., and absolutely specific for the given protein, is produced, and can be produced, in very large quantities, and that this leads to the hydrolysis of the antigen. Indeed it is nearly certain that it is the partial hydrolysis of the assaulting dose of antigen resulting in the production of some peptone-like substance that is the chief cause of the phenomena of anaphylaxis. In the test-tube this co-ferment produced for foreign red blood corpuscles and certain micro-organisms, for instance, the cholera vibrio, can be easily shown to produce their hydrolysis if sufficient complement, *i.e.*, ferment, is present. In the case of other micro-organisms, the lysis of which is not so obvious, it can be shown that they undergo lysis inside phagocytic cells, for instance, polynuclear leucocytes, if sufficient immune-body, that is co-ferment, is present.

But are these co-ferments just mentioned produced by the pancreas? The negative experiments of McGowan by the removal of such organs as the spleen, kidney, thyroid by extirpation and other methods show that this does not delay the production of the immune-body on the third day after a rabbit has been injected intravenously with ox-blood corpuscles, and he considers this strong evidence that the immune-body is not formed by these organs. He found that there was no leucocytosis observable in the rabbit after an intravenous, intraperitoneal or subcutaneous injection of ox-blood corpuscles. This further excludes the leucocytic organs, as far as they can be excluded by such a method, in the production of immune-body. McGowan suggests that the liver may be the source of this co-ferment. I think, however, this is unlikely, for, as we have seen in the case of carbohydrates, the liver is dependent on the co-ferments from the pancreas for their metabolism, for I have found that it is impossible, with the exception of certain cases of furunculosis with associated glycosuria, to immunise a diabetic, as one can a non-diabetic patient, against such infections as produce pyorrhœa alveolaris. In diabetics a minute dose of such an antigen is followed by an abnormal general reaction, sometimes also in certain cases a sensation of dis-

comfort, almost amounting to pain over the pancreatic region suggesting a focal reaction in the gland, and invariably accompanied by an increased excretion of sugar. A curve of the negative phase, unfortunately in these cases seldom followed by a positive phase, can be plotted out by the amount of sugar excreted after a dose. This, of course, might be due either to a general poisoning of the tissues, including the liver and kidneys, but I suggest, especially on account of the increase of focal symptoms in certain cases, that it is more probably owing to a focal reaction in the pancreas.

I think further evidence might be gained on this point if similar experiments to McGowan's were done on dogs with increasing amounts of the pancreas removed or the pancreas transplanted to subcutaneous tissues. It might further be possible to examine the pancreas press-juice of animals immunised against foreign red blood corpuscles or microbes for specific co-ferments. Of the difficulties of immunising a diabetic there can be no question whatever; the explanation of it I have suggested is at any rate a reasonable one.

I think there can be little doubt as to the cells which produce this internal secretion. The source of origin of the cell-islands of Langerhans is not known, but it is impossible to think that these cells with their special blood supply, the increase in size of the islands in certain conditions, *e.g.*, starvation, with their special morphology, staining and granule content, can be merely resting stages of the ordinary cells of the pancreas. The pancreas of a case reported by the late Dr. Scott, of Oxford, appears to my mind conclusive. The case was one of cancer of the head of the pancreas, causing complete occlusion of the ducts, while the rest of the gland was replaced by fat and fibrous tissue, the cell islands alone remained intact—there was no symptom of diabetes. On the other hand, Cecil, of New York, has reported a large series of cases of post-mortems on diabetics, and 87% of them showed definite gross lesions of the cell islands, and in a considerable number of these the lesions were in the cell islands alone. The remaining 13 per cent. can easily be accounted for by intoxication of the cells without gross morphological change, possibly due to either a

circulating toxin of whatever kind, for instance, from a gangrenous limb, or the deficiency may be possibly due to the absence of a hormone from the upper intestine, for Hill and Abrahamson have reported certain cases in which glycosuria disappeared or was markedly reduced after the exhibition of duodenal extract by the mouth.

If we accept Beard's theory of the alternation of generations, it is easy to formulate an hypothesis as to the reason for the production of this co-ferment.

The tissues of the sexual generation consist of lævo-proteins, and the fœtus as it develops lives at the expense of the phorozoon (larva), whose cells are hypothetically composed of the opposite stereoisomers, while in turn the cells of the larva, that is of the chorionic villi, consisting of dextro-protein,* are able to live at the expense of the maternal tissues of the uterus. These cells are able to produce the hydrolysis of their food by means of their ferments without the aid of a co-ferment. When, however, all the tissues of the phorozoon (larva) are used up the fœtus has to live if it is to survive on the same stereo-structure as itself. It is just at this period, which Beard calls the "critical period," that is, the period of fœtus is born in marsupials and the period in which mammalian placenta becomes functional that the pancreas with its cell-islands also becomes functional. Without it the fœtus could not survive, for the co-ferments which it produces adapt the tissue ferments of the fœtus to the same stereoisomers as itself, thus enabling them to katabolise and anabolise them.

It is clear that these substances are then in the nature of adapters, and I suggest the word 'adapter' as a generic name for all these products, co-ferments or immune bodies for the metabolism of foreign proteins, foreign red corpuscles, micro-organisms, carbohydrates, and of fats produced by the cell islands of Langerhans of the pancreas.

X-RAY TREATMENT WITH REFERENCE TO GYNÆCOLOGICAL PRACTICE.*

By EDWARD J. WATSON.

WHERE many modes of treatment for a pathological condition are advocated, it often seems to matter little which of them is selected in an individual case, as generally none of them are very much good. If, however, only two methods present themselves, these two generally have their advocates and each gives at all events a fair probability of success, and, therefore, a difficulty is experienced in deciding between them. This difficulty seems to me to arise in considering the most appropriate form of treatment for certain cases of myoma or myomata of the uterus, producing such symptoms as hæmorrhage or pain, and in which the choice appears to lie between operation and irradiation by *x*-rays or radium. Other methods may be suggested, but in the cases in which I have been consulted the choice always seemed to lie between these two. I have been asked to give my experiences and the impressions which I have gained in treating pathological conditions by *x*-rays and radium, specially with reference to gynæcological practice, and I shall endeavour to do so to the best of my ability.

May I say that I wish in no way to press the use of treatment by radiations, but to state as accurately as possible the results obtained in the cases which have come under my care, and as far as I can the effects of irradiation upon the structures affected, and so, perhaps, raise a discussion which may help to decide in what kind of case this method of treatment may be best employed.

There can, I think, be no doubt that in both *x*-rays and radium we have very powerful therapeutic agents, which are capable of producing very great changes in the living tissues, and very harmful effects if improperly used. These facts became evident very early, and while they were of advantage in that they led to persistence in experiment, they also

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led to these methods being employed where all else had failed, and while the technique was very imperfectly understood. Then too, irradiations were seldom if ever considered in early stages of disease, and rightly so, where these conditions could be satisfactorily dealt with by better known means. Now, however, with the introduction of the Coolidge tube, and with the use of filters, thus enabling the deeper structures to be safely irradiated without injuring the skin, definite doses of *x*-rays or radium can be applied to these structures with the expectation of fairly definite results to them, and I think that the position we have arrived at, or at all events are arriving at, is this: will these alterations which we can produce in these structures produce the desired result for the patient?

There are some points to be considered when employing *x*-rays as a mode of treatment, first of all a course of *x*-rays takes a considerable time, perhaps months to complete. Radium also often requires several applications with intervals of some weeks between each to attain the desired result, and it is often impossible to say how long a course may be necessary in a given case, or with very great certainty whether the treatment will succeed, so that in cases where radiations have been tried and have failed, it is then too late to embark on operative methods. Radiations are capable of producing profound alterations in the blood, and the number of white corpuscles may be much reduced if a too prolonged course is given.

To-night I am dealing with radiations with reference to gynæcology, and in this branch of medicine there are three classes of pathological conditions in which I have had experience with treatment by radiations, namely, (1) *x*-ray treatment of myomata; (2) of pruritus vulvæ; and (3) *x*-ray treatment combined with radium of inoperable and post operative cases of cancer in which the disease has recurred.

X-Ray Treatment of Myomata.

To take the treatment of myomata first, in these cases the radiologist, unless he also practises gynæcology, is dependent on the gynæcologist, after he has given, as far as possible, the possibilities of radiation treatment, for a decision as to the advisability of it, also for a description of the con-

dition to be treated, and for his knowledge of the progress of the local condition during the course of treatment, though he may form a good idea of the progress of the patient as to general condition.

I have treated 18 cases of myoma, all accompanied by more or less severe hæmorrhage and pain at the menstrual period. All the cases have been between the ages of 40 and 50. It is I think best to begin the course of treatment as soon as a period is over, and to give treatments on alternate days, which, if the period is at the normal interval, allows about 12 treatments. I always use an aluminium filter 3 mm. in thickness, placed midway between the skin of the patient and the tube, and during this course, *i.e.*, that before the first menstrual period after commencing treatment, I give a dose equal to 1 Sabouraud, measured through the filter, with a current through the tube of 3 ma. and an alternative spark gap of 4 in. This is not a large dose, the reason being, that I have noticed that after large initial doses sometimes that the hæmorrhage and pain at the next menstrual period have been increased. And I think it well to warn patients that this may occur. An interval of 10 days is then allowed to elapse, and another course of the same length is given, the dose this time being 1.5 S., and the milliamperage 3 to 3.5.

No more treatment is given for at least 3 months, and in 8 out of the 18 cases the general condition of the patients had improved, the hæmorrhage had ceased, and I was informed that the myomata had very considerably diminished in size, and as far as I could learn menstruation ceased, though I was not able to ascertain exactly when this occurred, except in 4 cases who told me that they had had no period after the second course of treatment. 6 of these 8 cases complained of pain prior to the *x-ray* treatment, and none of them referred to it after the first course. In these 8 cases there did not seem to be any further need for a continuance of the treatment.

3 cases of the series were given three such courses, occupying about 7 months, when the size of the tumour had diminished, and the hæmorrhage had ceased, 1 of these 3 cases I know to be quite well. Their treatment began in July, 1918, and ended in December of that year

4 cases were given 2 courses as above mentioned, lasting about 10 weeks altogether, when improvement was noticed in the size of the myomata, and hæmorrhage had apparently ceased. After 8 months, however, some hæmorrhage and pain returned, and as the myomata were still of some size, 10 further exposures were given, when the symptoms subsided, and in two of them did not recur. One of them has since been operated upon, and the other died of pneumonia during the influenza epidemic.

2 cases of the series were given one course of 12 exposures, in these the most prominent symptom was pain, which disappeared after 6 or 7 exposures, and I have not heard of them since. One case came to me in 1917 suffering from considerable pain and discomfort with some hæmorrhage at the menstrual period. I gave 2 full courses during March, April and May, the symptoms decreased and menstruation ceased. In 1918, however, the discomfort and some pain returned, and it was thought well to give a further 2 full courses in April and May, and one course during August, and after these courses the symptoms I was told subsided and certainly the general condition of the patient improved considerably. In June of last year this patient was again sent to me suffering from pain and discomfort, and some discharge from the vagina. She was given about 10 treatments, but after this on account of the nature of the discharge, operation was thought to be advisable, and the uterus was found to be the seat of malignant disease.

One case I treated was a case of a large myoma, with considerable pain. 3 full courses of *x-ray* treatment were given in 7 months. The myoma became somewhat reduced in size, but not sufficiently to give relief, and operation was then resorted to.

This, then, is the history of the series of cases which I have treated for myomata so far as I am able to give it. In none of the cases have the myomata been large, and I do not think that very large tumours are suitable for this form of treatment, a proportion of them were multiple, and it does not appear that this is a contraindication to *x-ray* treatment. In none of them was any indication of degeneration of the tumour, or any apparent tendency to malignancy, as it

seems evident that where operation is possible in cases where either of these conditions is present, that operation should precede treatment by irradiation.

When a myoma is treated by *x*-rays, the destruction of the ovaries by the conversion of the follicles into fibrous tissue, plays an important part in the reduction of the myoma, while the tissue of the myoma itself, and especially the muscle fibres, are also acted upon, and though all the muscle fibres may become fibrous, and the whole bulk may be reduced, it is not possible for the tumour to be made to completely disappear by this means. But it seems evident that the more muscle and the less fibrous tissue there is originally in a tumour, the greater will be the reduction in size brought about by *x*-ray treatment.

When, therefore, considering this form of treatment of myomata these two facts must be borne in mind, namely, that by *x*-rays the ovaries are destroyed while reducing the myoma, while by operation the myoma can be removed and the ovaries left intact, by *x*-rays the myoma does not completely disappear while operation completely removes it.

Further, it is not possible to determine the exact condition of a myoma in all cases before treatment, at least I believe this to be the case, except by operation, so that unless the condition of the tumour can be determined with considerable certainty, probably operation would be the safest course. Then there is the question of the probability or otherwise of myomata, which originally are quite benign, taking on a malignant character, for although the action of *x*-rays is undoubtedly very beneficial in the treatment of malignant conditions, and a tumour treated by these rays should be much less likely to take on malignant characters than one not so treated, the use of *x*-rays cannot be considered in cases where malignancy is suspected, and where operation is possible. These points, however, are entirely for the gynæcologists. Another point is the effect of *x*-ray treatment on the patient. A course of *x*-rays properly given should not have any deleterious effect upon the patient's general health, in fact I think that as a rule a patient's general condition improves during an *x*-ray course.

X-ray treatment does not interfere materially with a patient's occupation.

Many patients are anxious to avoid operation, and if irradiation is a safe and satisfactory substitute in certain cases, it is undoubtedly a great advantage, the difficulty being to choose the proper cases, and if the radiologists state their position clearly in the matter it becomes a decision for the gynecologists.

A myoma can be quite easily reduced in size by *x*-rays, and in the majority of cases hæmorrhage and pain can be stopped. I am sure that a gynecologist who was also a radiologist would be able to carry out such work more satisfactorily, and be able to decide what kinds of myomata respond most readily to treatment by radiations, but it would seem difficult for any one practitioner to give sufficient time to both branches except in very large centres, where a man can make a speciality of one condition.

The next class of case that I may mention is that of pruritus vulvæ, that is to say cases of this condition where an exciting cause such as vaginal discharge or abnormal condition of the urine is absent.

Pruritus Vulvæ.

The *x*-ray treatment in this condition has one great advantage to my mind, it seems easy to determine quite early in the treatment whether it is going to succeed or not, so that of late years only in 2 cases have I continued treatment for more than 3 weeks and failed to benefit the patient. During the last 6 years I have treated 12 cases of pruritus vulvæ. 3 of these cases had very little of the macerated appearance of the mucus membrane, though the irritation was intense, and these all improved after the first 3 treatments, given in 10 days, using 3.5 ma. through 1 mm. of aluminium 1 S. In these 3 cases 7 subsequent treatments were given in 4 weeks, and as far as I know they remained well, and 2 of them were certainly well 18 months afterwards.

4 others had very marked maceration of the mucus membrane, 2 of them behaved in the same way as the previous 3 cases mentioned, and got quite well, 2 of them were the 2 cases already alluded to, and although a prolonged treat-

ment was carried out, only a very slight temporary improvement resulted.

2 cases were treated in the same way with apparently as good a result as the first 3 cases mentioned, but after 6 months the symptoms returned, to respond as easily again to treatment, but again to relapse after a few months, and they come to me periodically to be put right for the time being. The remaining 2 cases were well marked, though not apparently as bad as some that responded easily to treatment, but after treating by 6 exposures for 3 weeks, no result was obtained, I there advised rest for a month, and as no improvement appeared I did not advise further treatment.

Malignant Disease of the Uterus.

The last series of cases of which I have had experience were cases of malignant disease. Of these I have had 7 under my care. There were 6 cases of post operative recurrence, and 1 inoperable case of carcinoma of the cervix. Irradiation after operation for malignant disease beginning as soon as possible after the operation has been much practised, and it seems to be a most useful precaution. I have so treated a considerable number of cases after the removal of the breast for cancer, and after other operations for the removal of malignant tumours, and none of the cases which I have subsequently heard of have recurred. I have not, however, treated such cases after hysterectomy, and the 6 cases I mention came under my care after recurrence had appeared. They were not very favourable for any kind of treatment. In 4 of these cases *x*-rays were combined with radium, and *x*-ray exposures of 2S. were given through a filter of aluminium 3 mm. thick over the lower part of the abdomen, and 30 mc. of radium was introduced into the vagina in a case of lead 1 mm. thick, and left in for 24 hours. The *x*-ray treatment was applied 3 times a week for periods ranging from 6 to 12 weeks, and the same quantity of radium was again introduced a month after the first application. The other 2 cases were treated in the same manner, except that the radium treatment was omitted. In all these 6 cases there was decided relief of pain after the

treatment was in progress for about a week, and the discharge which was present at first seemed to diminish, they improved in general condition for a time and were more comfortable, they all, however, died between 12 and 18 months after the commencement of the treatment. The case of inoperable carcinoma of the cervix was treated in the same way, with radium and *x*-rays. At first improvement was marked, and relief was obtained to a great extent from pain and discomfort, but the patient died in about a year.

In these last two classes of case there seems to be no doubt that treatment by irradiation has very decided advantages, as it gives a fair probability of a cure in pruritus vulvæ, and in these cases except for short delay, even if it fails, the patient is no worse off than before. While in cases of inoperable cancer, it really is found to give decided relief. It is over 2 years since I treated the last of these cases, and at present I should advise larger doses of both *x*-rays and radium, with I think a probability of further success.

As to the treatment of myomata, as I have said, a radiologist is not in a position to advise except in conjunction with a gynæcologist, a case of simple myomata, of moderate size, causing symptoms such as pain and hæmorrhage, can be dealt with in this way, and as our experience increases and our technique improves, it seems probable that more advanced cases will be successfully treated by this method, and, indeed, have already been so treated with a fair amount of success, but radiologists are anxious to hear from gynæcologists in these cases, their opinion as to the desirability of treatment by irradiations, and their views as to the present and possible results, as compared with other methods.

This is not a large enough number of cases of these three different conditions on which to base very definite conclusions, and I fear that the description which I have given is very inadequate, but I hope that some indications of the possibilities of radiation treatment may be obtained from them, and also that other radiologists present who have a wider experience than I may give their views on the subject.

REPORT OF THE ROTUNDA HOSPITAL.

By J. S. ENGLISH, M.D., and A. H. DAVIDSON, M.D.

Assistants to the Master.

DURING the year 1918-1919 the hospital lost one of its consulting staff through the death of Dr. R. D. Purefoy, who, during nearly fifty years, had always shown a keen interest in the welfare and working of the hospital, and from the termination of his mastership in 1903 and his election on the consulting staff was always ready with his advice and assistance whenever called upon. During three years of the war, Dr. Purefoy, together with the other members of the consulting staff, carried on the work of the hospital, and to him the hospital is indebted for a well-equipped pathological laboratory. Dr. Henry Bewley resigned the post of consulting physician, and was succeeded by Dr. H. C. Drury. Another important change was due to the resignation of Miss Lucy Ramsden, who had been matron from 1896, and to whom much of the improvement in the nursing of the hospital and the training of midwives, which has taken place in the last quarter of a century, is due.

In the extern maternity there were attended 1,505 cases of labour with seven maternal deaths; two of these were due to pneumonia during the epidemic of influenza.

In the intern maternity 2,036 cases were treated and 1,785 women delivered. Amongst these were five cases of accidental hæmorrhage, all of the external type, and all recovered. Eleven cases of unavoidable hæmorrhage included three deaths—two from septic infection and one a 7-para, 25 weeks pregnant, with severe toxæmia, who was under treatment for eight days before the first hæmorrhage occurred. The vagina was plugged, and after 21 hours the os admitted of bi-polar version being done, delivery in 2½ hours was followed by some postpartum hæmorrhage, for which the uterus and vagina were plugged, but the patient died two hours later. At the P.M. the uterus was found well contracted, the cervix intact, definite nephritis and pericardial fluid. Twenty-one cases of contracted pelvis were treated; 17 babies were born alive, and one mother

died of influenzal-pneumonia. Pubiotomy was performed eight times and delivery completed with forceps three times, and after version on account of prolapse of the cord once. Five cases had the pubic bone divided from one week to two months before labour, and two of these delivered themselves spontaneously. One case had pubiotomy done in 1912 and delivered herself spontaneously, another done in 1916 was delivered easily with forceps.

Cæsarean section was done nine times, six being for contracted pelvis, and one of these cases had had the operation four times previously. In one case labour was obstructed by a myoma, and as there were many others showing degeneration all through the uterus, the uterus was removed. Another case of obstruction was due to posterior development following ventral fixation. There were eleven cases of eclampsia in the hospital and five in the extern, with two deaths in each department. Of those in the house nine babies were born alive. In five of the cases the fits were wholly postpartum, one of the cases that died developing on the fourth day.

Forceps were applied in 88 cases, once to impacted breech and once to an after-coming head. Nine children were born dead. Forty-three children were delivered as breech presentations with five dead, one macerated. The morbidity for the year on the B.M.A. standard was 6.19; it was increased by the epidemics of influenza which occurred in November and February, but, on the whole, the hospital remained wonderfully free of the infection. Of the cases of genital origin, one received vaginal douching only, 26 utero-vaginal douching, 14 applications to the perinæum only. Vaccine was given in 17 cases and hysterectomy done in three. Only three patients received more than two douches. In 12 cases streptococci were found and ten recovered; in three cases streptococci with coli were found and two recovered. Hysterectomy was done in three cases and one recovered. In this case when the uterus was removed it was found to contain a small placenta firmly adherent to the fundus and evidently belonging to a twin pregnancy which had died and been retained.

The following are short notes on some of the cases that died in hospital:—

C. C., aged 32, was delivered normally in hospital, developed an eclamptic fit on the fourth day of the puerperium, not having shown any warning symptoms; ten fits occurred in all, and the patient died 12 hours after first attack.

M. F., aged 34, para. 12.—A case of placenta prævia. A rigor occurred on the 5th day. Culture taken and uterine douche given. No definite result from culture. Stock streptococcic vaccine given on four occasions with no improvement. On 15th day of puerperium, supra-vaginal hysterectomy performed. Both uterine veins and right ovarian vein thrombosed. Right ovarian vein removed as high as possible. Patient improved after operation. Vaccines continued. Shortly afterwards patient's kidneys became infected, and she died 42 days after operation. P.M.—Purulent peritonitis, septic infarcts in kidneys and liver. Right ureter distended to $\frac{1}{4}$ inch thickness throughout its whole course.

E. C., 30, para. 5.—Case of albuminuria, premature triplets born after 18 days in hospital. Temperature rose 3rd evening, rigor occurred on 12th day. Culture taken, but gave no result. Uterus douched. Uterine douche and stock vaccines given on several occasions without result. On 23rd day supra-vaginal hysterectomy done; patient died at operation. P.M.—Uterine and ovarian veins thrombosed. Septic infarcts in kidneys.

M. H., 20, para. 1.—Three months pregnant with severe hyperemesis. In spite of all treatment the vomiting became worse, so the uterus was emptied on the 4th day. Patient did not recover from the shock, and died 6 hours later. P.M. showed nothing of importance.

M. M., 30, para. 1.—Admitted in eclampsia at term; had four fits in all, and died undelivered 18 hours after admission. Twins were delivered dead by post mortem section.

W. S., 25, para. 3.—A case of placenta prævia centralis, admitted having been plugged. Bi-polar version done and delivery followed in half an hour. Temperature rose on 2nd evening and a rigor occurred on 9th day. Culture showed streptococci and coli bacilli. Stock and autogenous vac-

cines given and interior of uterus swabbed several times with tincture of iodine. Patient died on 25th day. P.M.—Kidneys, spleen and liver congested; some pus in pelvis of right kidney and right broad ligament.

EXTERN MATERNITY.

1918-1919.

TABLE NO. I.—*Nature and Number of Cases Treated.*

Total deliveries	1,505	Rupture of Uterus	1
Abortions and Miscarriages	234	Laceration of Perinæum	168
Presentations—		Operations—	
Vertex	1,230	Episiotomy	2
P.O.P.	6	Forceps	35
Face	4	Version	9
Brow	2	Perforation	1
Breech	48	Craniotomy	1
Transverse	7	Spondylotomy	1
Twins	21	Manual Removal of Placenta	19
Prolapse of Cord	1	Maternal Mortality	7
Hydramnios	7	Infants Stillborn	66
Eclampsia	5	Foetal abnormalities—	
Hæmatoma Vulvæ	1	Hydrocephalus	1
Hæmorrhage—		Vesicular Mole	1
Unavoidable	5		
Accidental	3		
Post-partum	15		

TABLE No. II.—(*Extern Maternity*) *Mortality*.

Name	Age	Para	Date of Delivery	Date of Death	Cause of Death	Remarks
K.C.	36	V.	10. 2.19	17. 2.19	Pneumonia	Labour 72 hours, Fœtus dead. Os $\frac{3}{4}$ dilated. Head not fixed. Forceps. Fœtus macerated.
C.D.'A	30	?	23. 2.19	23. 2.19	Pneumonia	Patient moribund. Forceps. Fœtus dead. Died 1½ hours after delivery.
H.	26	III.	9. 3.19	?	?	4½ months miscarriage. Macerated fœtus Placenta and membranes complete; no further note.
L.	26	III.	13. 3.19	16. 3.19	?	Placenta Prævia Centralis. Toxæmia. Marked Albuminuria. Podalic Version Patient collapsed. Child dead. Placenta spontaneous. Secondary collapse. Pulse remained above 120. Temp. rose 2nd day to 101.5. Died 3rd day.
M. C.	25	I.	Non	15. 4.19	Eclampsia	Had 8 fits when first seen. Routine treatment. Four more fits. Comatose all through. Colon lavage repeated. Submammary Soda Bicarb. infusion. Died five hours later. Patient having had fits. Comatose. Constant vomiting prevented passage of stomach tube. Colon lavage and Morph. $\frac{1}{2}$ gr. Oedema of both lungs.
M.E.D.	?	?	Non	2. 6.19	Eclampsia	Labour normal. Lacerated perinæum. Puerperal ulcer 2nd day. Improved till 7th day. Uterine infection. Serum vaccine and general treatment. 13th day Thrombo-phlebitis. 16th day Broncho-pneumonia.
E. B.	33	V.	13. 9.19	6.10.19	Septicæmia	

INTERN MATERNITY.

TABLE I.—*Total Admissions and Deliveries.*

1918-19	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total
Total deliveries .	125	105	152	150	147	127	149	155	171	150	171	183	1785
Not in labour .	18	6	10	17	29	26	28	24	29	27	28	9	251
Total admissions .	143	111	162	167	176	153	177	179	200	177	199	192	2036

TABLE II.—*Nature and Number of Cases Treated.*

Total Admissions .	2,036	Accidental Complications—con.	
Total deliveries .	1,785	Eclampsia .	11
Primiparæ .	675	Insanity .	4
Multiparæ .	1,110	Thrombo-phlebitis .	2
Presentations—		Mastitis .	5
Vertex .	1,630	Dermatitis Herpetiformis .	1
P.O.P. .	16	Operations—	
Face .	6	Induction of Labour .	4
Brow .	3	Episiotomy .	8
Breech .	43	Cleidotomy .	2
Transverse .	11	Suture of Perinæum .	438
Parietal .	2	Forceps .	88
Twins .	29	Version .	20
Triplets .	1	Cæsarean Section .	9
Complications of Pregnancy—		Pubiotomy .	8
Hyperemesis .	2	Craniotomy .	2
Vesicular Mole .	1	Decapitation .	1
Hydramnios .	6	Evisceration .	1
Abortions and Miscarriages .	43	Manual Removal of Placenta .	22
Albuminuria .	18	Morbidity B.M.A. standard .	112
Hæmorrhages—		Percentage .	6.27
Unavoidable .	11	Mortality .	10
Accidental .	5	Percentage .	0.56
Post-partum .	22	Infant Statistics—	
Hæmatoma Vulvæ .	2	Dead born .	67
Lacerations of Perinæum—		Fœtal Abnormalities—	
Complete .	1	Anencephalus .	4
Incomplete .	438	Cleft Palate and Hare Lip .	5
Contracted Pelvis .	21	Spina-Bifida .	5
Retained Placenta .	22	Umbilical Hernia .	1
Prolapse of Cord .	8	Talipes .	9
Accidental Complications—		Hydrocephalus .	3
Pyonephrosis .	1	Imperforate Anus .	1
Epilepsy .	1	Infantile Complications—	
Phthisis .	1	Ophthalmia .	2
Pulmonary Embolus .	1	Melæna .	6
Stenosis of Vagina .	1	Icterus .	5
Pneumonia .	3	Depressed Fracture Skull .	1
Pernicious Anæmia .	1	Cephalhæmatoma .	6
		Hæmorrhage from Cord .	1

TABLE No. III.—*Unavoidable Hæmorrhage.*

Name	Age	Para	Variety	Period	Initial Pre-sentation	Result to Mother	Result to Child	Delivery in hours	Treatment and Remarks.
E. B.	40	VI.	Marginal	Term	Vertex	Recovery	Alive	5	Bipolar Version.
C. C.	40	XIV.	Central	Term	Vertex	Recovery	Dead	8	Bipolar Version.
E. L.	31	IV.	Lateral	26 weeks	Breech	Recovery	Dead	2	Foot brought down.
T. M.	34	VII.	Central	25 weeks	Vertex	Died	Dead	23	In hospital for albuminuria. Vagina plugged. In 21 hours Bipolar Version performed. Some P.P.H. and uterus and vagina plugged. <i>Vide</i> No. X.
L. D.	32	VII.	Marginal	Term	Vertex	Recovery	Dead	5	Bipolar Version.
M. F.	34	XII.	Marginal	Term	Vertex	Died	Dead	1	Bipolar Version. Venous Sepsis. <i>Vide</i> No. X.
M. B.	24	V.	Lateral	29 weeks	Transverse	Recovery	Mac	1	Bipolar Version.
J. D.	28	III.	Central	Term	Vertex	Recovery	Mac	2	Bipolar Version; morbid; child monster.
J. D.	20	II.	Lateral	26 weeks	Vertex	Recovery	Alive	3	Os $\frac{3}{4}$ dilated, membranes ruptured; morbid.
W S.	25	III.	Central	Term	Vertex	Died	Dead	6	Plugged before admission. Bipolar Version. Adherent Placenta. Pyæmia. <i>Vide</i> No. X.
R. B.	27	III.	Lateral	Term	Vertex	Alive	Dead	$\frac{1}{2}$	Bipolar Version; morbid; insanity.

TABLE NO. IV.—*Accidental Hæmorrhage.*

Name	Age	Para	Variety	Period	Presentation	Result to Mother	Result to Child	Treatment and Remarks.
R. D.	35	XI.	External	8 months	Vertex	Recovered	Alive	Membranes ruptured.
M. R.	38	XII.	External	Term	Vertex	Recovered	Alive	Membranes ruptured. Morbid.
M. H.	38	XII.	External	8 months	Vertex	Recovered	Macerated	Vagina plugged. Strong labour in 12 hours. Albuminuria.
H. B.	30	III.	External	8 months	Twins 1st Vertex 2nd Breech	Recovered	Alive	Membranes ruptured.
M. C.	31	VII.	External	6 months	—	Recovered	Dead	Vagina plugged before admission. Hæmorrhage recommenced. Vagina again Plugged. No labour in 24 hours. Uterus emptied after dilatation of cervix. Morbid.

TABLE No. V.—*Contracted Pelvis.*

Measurements were made with Skutsch's Pelvimeter.

Name	Age	Para	MEASUREMENTS		Presenta- tion	Mode of Delivery	Result to Mother	Result to Child	Weight of Child	Remarks
			C.V. cms.	T. cms.						
E. B.	32	V.	7.0	10.8	Vertex	Cesarean Section	Re- covered	Alive	7 $\frac{3}{16}$ lbs.	<i>Vide</i> Table No. VIII.
C.M'C.	25	I.	10.0	—	Vertex	Spontaneous	Re- covered	Alive	8 $\frac{7}{16}$ lbs.	—
C.O'C.	28	V.	8.95	11.85	Vertex	Spontaneous	Re- covered	Alive	8 lbs.	Pubiotomy in 1912, no bony union.
S. W.	26	I.	7.7	13.7	Vertex	Pubiotomy	Re- covered	Dead	9 $\frac{1}{8}$ lbs.	Pubiotomy, Hydro- cephalic.
M. G.	31	VI.	9.25	10.5	Vertex	Forceps	Re- covered	Alive	8 $\frac{7}{16}$ lbs.	Pubiotomy 1916. Trac- tion easy.
M.M'T.	28	V.	7.5	12.5	Vertex	Pubiotomy Version	Re- covered	Alive	6 $\frac{7}{16}$ lbs.	Pubiotomy a month be- fore labour. (1) P.O.P. dead. (2) Transverse dead. (3) and (4) C.S. Table VI.
E. F.	30	I.	9.1	12.15	Vertex	Forceps	Died	Dead	6 lbs.	Adherent Placenta. Died of Pneumonia, 15th day. <i>Vide</i> X.
M. R.	24	II.	8.5	—	Brow	Craniotomy Cleidotomy	Re- covered	Dead	7 $\frac{1}{2}$ lbs.	Fœtus dead. Morbid.
M. M.	39	I.	10.0	—	Vertex	Spontaneous	Re- covered	Alive	5 $\frac{1}{16}$ lbs.	—
M. S.	27	I.	7.05	13.20	Vertex	Cesarean Section	Re- covered	Alive	3 $\frac{5}{16}$ lbs.	Table VIII.
W. B.	21	I.	—	—	Vertex	Craniotomy	Re- covered	Dead	8 $\frac{1}{16}$ lbs.	Forceps failed, fœtus dead.

TABLE No. V.—*Contracted Pelvis*.—*continued*.

Name	Age	Para	MEASUREMENTS		Presenta- tion	Mode of Delivery	Result to Mother	Result to Child	Weight of Child	Remarks
			C.V. cms.	T. cms.						
M. R.	25	III.	8.9	12.9	Vertex	Spontaneous	Re- covered	Alive	7 $\frac{4}{16}$ lbs.	—
K. B.	28	V.	7.6	—	Vertex	Pubiotomy and Forceps	Re- covered	Alive	8 $\frac{5}{16}$ lbs.	Pubiotomy 2 months. Forceps. Vesico Vaginal fistula.
A. L.	29	IV.	8.1	—	Anterior Parietal	Pubiotomy and Forceps	Re- covered	Alive	9 $\frac{3}{16}$ lbs.	—
E. S.	39	I.	—	—	Vertex	Cæsarean Section	Re- covered	Alive	6 $\frac{14}{16}$ lbs.	Marked Kyphotic-funnel shaped pelvis. Table VIII
M. B.	26	V.	—	—	Breech	Cæsarean Section	Re- covered	Alive	8 $\frac{5}{16}$ lbs.	Oblique conjugate 10.25 cms. (1) C.S. Table No. VIII.
E. F.	26	II.	9.1	—	Vertex	Pubiotomy	Re- covered	Alive	7 $\frac{15}{16}$ lbs.	Pubiotomy.
M.M'S.	28	I.	9.6	12.9	Vertex	Spontaneous	Re- covered	Alive	10 $\frac{2}{16}$ lbs.	—
K.O'S.	34	X.	9.5	11.7	Vertex	Pubiotomy	Re- covered	Alive	7 $\frac{7}{16}$ lbs.	Pubiotomy 1 month be- fore. Walked 6th day. All full term labours with Forceps; two dead.
A. B.	28	III.	Inlet	Normal	Vertex	Pubiotomy	Re- covered	Alive	8 $\frac{5}{16}$ lbs.	Pubiotomy 1 $\frac{1}{2}$ months be- fore Outlet. Trans. 7.5 Antero posterior 11.2 cms. (2) forceps died $\frac{1}{2}$ hour after birth.
S. H.	30	II.	8.4	11.8	Vertex	Pubiotomy and Forceps	Re- covered	Alive	7 $\frac{4}{16}$ lbs.	Pubiotomy a week before Adherent Placenta; morbid.

TABLE NO. VI.—*Prolapse and Presentation of Cord.*

Name	Age	Para	Weight of Child	Presentation	Treatment	Result to Mother	Result to Child	Remarks
M. R.	23	II.	7 lbs.	Vertex	—	Recovered	Dead	Pulseless on admission.
M. D.	30	I.	8 $\frac{2}{16}$ lbs.	Breech	—	Recovered	Dead	First of twins. Pulseless on admission
M.M.T.	28	V.	6 $\frac{2}{16}$ lbs.	Oblique	Internal Version and Extraction	Recovered	Alive	<i>Vide</i> table No. V. Prolapsed with rupture of membranes.
M. D.	38	II.	8 $\frac{11}{16}$ lbs.	Transverse	Internal Version	Recovered	Dead	—
B. L.	21	I.	7 $\frac{4}{16}$ lqs.	Breech	—	Recovered	Dead	Pulseless on admission.
M. M.	25	I.	6 $\frac{5}{16}$ lbs.	Vertex	Forceps	Recovered	Dead	Prolapsed on admission. No pulsations just before forceps.
A. D.	40	XIII.	6 $\frac{2}{16}$ lbs.	Oblique	Cord re-placed and Vertex engaged in brim	Recovered	Alive	—
M. B.	21	I.	8 $\frac{15}{16}$ lbs.	Vertex	Forceps	Recovered	Alive	Prolapsed on admission. Episiotomy.

TABLE No. VII.—*Eclampsia*.

Name	Age	Para	Period of Preg-nancy	Condition on Admission	Urine	No. of Fits			Treatment	Result to Mother	Result to Child	Remarks
						Before Labour	During Labour	After Labour				
J. L.	27	II.	Term	Conscious	Albumen very marked	—	—	1	Routine	Re-covered	Alive	10 hours after delivery.
M. P.	40	II.	Term	Conscious	Albumen very marked	—	—	3	Routine	Re-covered	Alive	3½ hrs. after delivery; last fit 28 hrs. later.
M.M'K.	38	XII.	36	Conscious	Albumen marked	—	—	1	Routine	Re-covered	Alive	12 hrs. after delivery. Baby died 5th day.
C. C.	32	VII.	Term	Conscious	Albumen very marked	—	—	10	Routine + Restoratives	Died	Alive	4th day of puerperium; died in 12 hrs. Table X
M. F.	36	VII.	30	Conscious	Albumen very marked	9	—	—	Routine	Re-covered	Dead	—
M. H.	23	I.	Term	Conscious	Albumen marked	—	—	1	Routine	Re-covered	Alive	5½ hrs. after delivery.

TABLE No. VII.—*Eclampsia*—continued.

Name	Age	Para	Period of Preg-nancy	Condition on Admission	Urine	No. of Fits			Treatment	Result to Mother	Result to Child	Remarks
						Before Labour	During Labour	After Labour				
K. D.	27	I.	34	Conscious	Albumen very marked	1	—	—	Routine	Re-covered	Alive	—
M. A.	41	I.	37	Conscious	Albumen very marked	—	1	1	Routine	Re-covered	Alive	Delivered with Forceps Last fit 11 hrs., <i>post-partum</i> .
S. T.	25	I.	38	Conscious	Albumen very marked	—	1	1	Routine	Re-covered	Alive	Last fit 2 hrs. <i>post-partum</i> .
M. M.	30	I.	Term	Conscious	Albumen very marked	4	—	—	Routine + Venesection + Restoratives	Died	Twins both dead	P.M. Caesarian Section. Table X.
K. H.	30	I.	30	Conscious	Albumen very marked	—	1	1	Routine	Re-covered	Alive	Last fit 16 hrs. <i>post-partum</i> . Baby died 2nd day, weight 2 lbs.

TABLE No. VIII.—*Cæsarean Section.*

Name	Age	Para	Date	Nature of Operation	Indication	When Performed	Result to Mother	Result to Child	Remarks
E.O'C.	29	VI.	18.11.18	Conservative (Classical)	Obstructed labour	In labour	Alive	Dead	Post development of uterus after ventral suspension; Previous normal.
E. B.	32	V.	22.11.18	Conservative (Classical)	Contracted Pelvis	In labour	Alive	Alive	4 C.S. Table V.
A.M'G.	40	XI.	9. 1.19	Conservative (Classical)	Contracted Pelvis	Before labour	Alive	Alive	2 C.S., 1 craniotomy, 1 breech, dead, 1 premature alive.
M. R.	28	I.	28. 2.19	Conservative (Classical)	Contracted Pelvis and Vagina	In labour	Alive	Alive	Upper part of vagina constricted by septum.
C.O'G.	38	III.	15. 4.19	Radical	Myoma obstructing delivery	In labour	Alive	Alive	Double promontory.
M. S.	27	I.	6. 6.19	Conservative (Classical)	Contracted Pelvis	In labour	Alive	Alive	Pedunculated myoma in Douglas' pouch. Multiple Fibroids.
E. S.	39	I.	13. 8.19	Radical	Contracted Pelvis	In labour	Alive	Alive	(Table V.)
M. B.	26	V.	4. 9.19	Conservative (Classical)	Contracted Pelvis	Beginning of labour	Alive	Alive	Kyphotic (lumbo-sacral) pelvis. Tubercular abscess pointing in pelvic meso-colon, drained through vagina. (Table V.).
M. M.	30	I.	19. 9.19	<i>Post-mortem</i>	Eclampsia	Before labour	Alive	Alive	1 C.S., 3 dead born. (<i>Vide</i> Table V.).
						—	—	Both dead	See Tables VII. and X.

TABLE NO. IX.—*Morbidity (B.M.A. Standard).*

1918-19	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total
Total deliveries	125	105	152	150	147	127	149	155	171	150	171	183	1785
Cases Morbid	8	3	8	13	7	6	6	10	6	12	18	15	112
Percent	6.4	2.86	5.26	8.66	4.76	4.72	4.02	6.45	3.51	8.0	10.5	8.19	6.19

TABLE NO. IX.A.—*Extra-genital Causes of Morbidity.*

Influenza . . .	7	Lobar Pneumonia	2	Erysipelas . . .	1
Constipation . .	6	Mastitis . . .	5	Cellulitis Ankle . .	1
Crural Phlegmasia	1	Nasal Catarrh . .	2	Albuminuria . . .	1
Phthisis . . .	2	Tonsillitis . . .	2	Rheumatic Fever	1
Cystitis . . .	4	Dermatitis Herp.	1	Nephritis . . .	1
Broncho-Pneum. .	4	Typhoid Fever . .	1		
Bronchitis. . .	1	Pyonephrosis . .	1	Total . . .	44

TABLE NO. IX.B.—*Operative Cases showing Morbidity.*

	Cases	Morbid	Per cent.	Remarks
Application of Forceps .	88	10	11.36	1 with prolapse of cord
Manual Removal Placenta	22	7	31.82	1 with Phlegmasia
Induction of Labour .	4	3	75.0	1 with Vesicular Mole and 1 Hyperemesis (fatal)
Hæmorrhage Unavoidable	11	6	54.54	1 with Adherent Placenta.
„ Accidental .	5	1	20.0	—
„ Post-parium	22	3	13.64	—
Pubiotomy . . .	8	2	25.0	1 with hydrocephalus
Craniotomy . . .	2	1	50.0	—
Evisceration . . .	1	1	100.	Attempted Forceps outside.
Breech . . .	43	2	4.65	—
Suture of Perinæum .	438	16	3.7	9 with forceps.

TABLE No. X.—*Maternal Mortality.*

Name	Age	Para	Admitted	Delivered	Died	Cause of Death	Remarks
C. C.	32	VII.	18. 1.19	19. 1.19	23. 1.19	Eclampsia	Vide Table VII.
A. M.	27	I.	13. 2.19	14. 2.19	14. 2.19	Broncho-pneumonia	Admitted with consolidation of left base. Died 5 hours after delivery.
M. M.	33	IV.	26. 2.19	26. 2.19	16. 3.19	Double	—
E. F.	30	I.	14. 3.19	14. 3.19	28. 3.19	Broncho-pneumonia Lobar Pneumonia	Forceps, <i>post-partum</i> , hæmorrhage, manual removal of placenta.
T. M.	34	VII.	17. 6.19	26. 6.19	26. 6.19	Placenta Prævia Centralis and <i>Post- partum</i> Hæmorrhage	See Table III. and ante.
M. F.	34	XII.	8. 7.19	8. 7.19	6. 9.19	Pyæmia	See ante.
E. C.	30	V.	26. 8.19	13. 9.19	10.10.19	Pyæmia	See ante.
M. H.	20	I.	8. 9.19	13. 9.19	14. 9.19	Hyperemesis Gravidarum	See ante.
M. M.	30	I.	18. 9.19	<i>post- mortem</i>	19. 9.19	Eclampsia	See ante. and Table VII.
W. S.	25	III.	29. 9.19	29. 9.19	23.10.19	Lymphatic Sepsis	See ante.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

The Diseases of Infants and Children. Vols. I. and II. By J. P. CROZER GRIFFITH, M.D., Ph.D. W. B. Saunders. Co. Phil. and Lond. 1921.

THIS important work on the diseases of children will be a welcome addition to the already rather extensive literature on pediatrics. It is bound in two volumes, and the author states that he has made it as complete as possible without attempting to make an encyclopædic. The book will be found of particular value to the general practitioner, since special subjects, such as affections of the skin, the eye, and the ear, have each been touched on briefly, whilst the more common ailments and diseases are dealt with in a most comprehensive and practical manner. Twelve chapters at the beginning of the first volume are devoted to what the author terms "General Subjects." In these 250 odd pages is gathered such a wealth of miscellaneous information as to almost nullify the author's denial of the encyclopædic character of his work. Such subjects as normal development are dealt with, physiology also, and hygiene, from infancy to youth. It is rare, indeed, to get a coloured plate of a normal infant's stool, or useful hints on the administration of medicines, side by side with sound advice on the furnishing of a nursery, clothing of children and selection of schools and pastimes, all in a book entitled *Diseases of Infants and Children*.

The value of this section and of the whole book is much enhanced by a complete index, references and cross-references and numerous tables, charts and illustrations. Weights and measures, too, are given in both British and Centigrade systems, whilst interesting averages and statistics have been drawn from numerous well-known authorities.

As is fitting in such a work, however, the commoner childish disorders are those selected for the most comprehensive study; thus the sections on the digestive system and on infectious diseases are amongst the fullest in the book, whilst the respiratory and nervous systems are both treated thoroughly and in an eminently practical manner. The

style of this work throughout, together with its suggestive and scientific outlook render it really fascinating and instructive reading. It is a book which we can unreservedly recommend.

D. K. M. H.

Selected Lectures and Essays, including Ligaments, their Nature and Morphology. 4th Edition. By SIR JOHN BLAND SUTTON. Heinemann. London, 1920. Pp. xi. + 320. 15/-.

THE first part of this book is an old and very fascinating friend. In the third edition of *Ligaments*, Sir John tells us in his preface that he has been accused of inveigling students from the study of practical human anatomy, and he concludes that if this be so the fault lies with the teachers rather than with him. The fact is that there is nothing like morphology for fixing anatomical detail in the minds of students, and the eagerness with which any information of the kind is absorbed is a measure of the thirst kindled by the manuals of dissection.

The text in this part has been very little altered, but new illustrations have been added. (On p. 59, the *flexor carpi ulnaris* referred to in the text is figured as an extensor.)

The new essays deal with all kinds of subjects—the slings and pulleys of the turkey's eye, deer's antlers, pulque, the male uterus, circumcision, bull-fighting. There is a particularly interesting chapter on the apocryphal miracle of the Book of Tobit.

A review of atrocities in warfare introduces the Hivites, the Welsh, and the *os penis* of the otter. One is often reminded of Buckland's *Curiosities of Nature*.

The book concludes with the tale of a convoy, which the author accompanied on board an armed cruiser. He writes of the "Marconi," the paravane, the protective striping of ships and zebras. We venture to think Sir John in error about the zebra. Ridgeway, in his Presidential Address to the Section of Zoology of the British Association in 1918, says:—"It is asserted by the most experienced hunters that the gaudy livery of the zebra makes him conspicuous from afar, whether he is on the mountain, on the plain, or in the shade of a tree." The only two formidable foes of the

zebra are man and the lion, and "the best authorities hold that lions hunt entirely by scent."

Occasionally one finds a Bland Sutton *en pantoufles*, but he disowns this criticism by dedicating the book to his old students.

A. K. H.

Syphilis and Its Treatment, with Special Reference to Syphilis of the Skin. By WILFRED S. FOX, M.D. London: H. K. Lewis and Co., Ltd. 1920. 8vo. Pp. viii. + 195. XLII. Plates (XIV. Coloured).

THIS work, designed for the use of students and practitioners, is an exposition of the practice at St. George's Hospital, London, with special reference to the cutaneous manifestations of syphilis. The description of the skin lesions of the disease is, on the whole, good, and the illustrations, many of them in colour, are excellent. It is perhaps open to question whether in a manual intended for the use of students too much stress has not been laid on the skin lesions, and too little on the other manifestations of the disease. Experienced practitioners, however, will find the descriptions and the illustrations helpful. In this part of the book there is, of course, little that is new, except the pictures, and one instinctively turns to the chapters on treatment in order to find out the author's actual personal experience. This part of the book appears the least satisfactory. At the present time there is considerable difference of opinion as to the best method of treating syphilitic patients, and in order to form a judgment on this subject definite information is required as to the results obtained from any special method. Such information is not supplied to us by Dr. Fox. Closely connected with the treatment of the disease is the question of prognosis. When are we justified in considering our patient cured of the disease? In answering this question the book gives us little help.

In drawing attention to these, which we consider important omissions from a work on syphilis, we do not wish to detract in any way from what the book does contain. As already pointed out, the description and illustrations of the cutaneous lesions are excellent, and will well repay a careful study.

OBITUARY.

BARKER, JAMES. Died April 10, 1921. Born January 3, 1840. Educated in Dublin; L.R.C.S.I., 1859; L.R.C.P.I., 1860; Assistant Surgeon, Army, September 30, 1863; Staff Surgeon, March 23, 1867; Surgeon-Major, April 28, 1876; retired Surgeon Lt.-Col., October 10, 1888. Died in London.

BUCHANAN, LEWIS. Died May 2, 1921. Born at Ballyjamesduff, Co. Cavan, July 21, 1850. Educated at Rathmines School and Trinity College, Dublin; B.A., 1875; M.B., 1878, Dub.; L.R.C.S., Edinb., 1878; L.Mid., R.C.P.I., 1878; Medical Officer of Arvagh Dispensary District since 1878. Died at Arvagh, Co. Cavan.

DEMPSEY, MARTIN JOSEPH PAUL. Died May 20, 1921. Born in Dublin. Educated at Castleknock College and the Catholic University School of Medicine; B.A., 1887; M.B., B.Ch., B.A.O., 1890; M.D., 1893; R.U.I. Lic., 1894; Member, 1895; Fellow, 1900, Royal College of Physicians of Ireland; Lecturer in Materia Medica, University College Dublin; Physician, Mater Misericordiæ Hospital; Fellow of the Royal Academy of Medicine in Ireland.

ROYAL NAVAL DENTAL SERVICE.

The Admiralty is prepared to receive applications for entry into the Royal Naval Dental Service.

The Regulations for entry, etc., will be forwarded on application to the Medical Director-General, Admiralty, 1 Lake Buildings, St. James's Park, London, S.W. 1.

Candidates must not be under Twenty-one nor over Twenty-eight years of age, and must be registered under the Dental Act as qualified to practise Dental Surgery in Great Britain and Ireland. They will be required to pass a Medical Examination as to their physical fitness.

The number of appointments to be offered and the date of the Competitive Examination will be announced later.

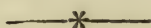
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**ROTUNDA LYING-IN HOSPITAL.
CLINICAL REPORT FOR THE YEAR
1919-1920.**

By GIBBON FITZGIBBON, M.D., Master; J. S. ENGLISH,
M.D., and A. H. DAVIDSON, M.D., Assistants.

AT the beginning of the year 1919-1920 the hospital lost the services of Dr. Robert J. Rowlette, who had filled the post of pathologist since 1904, and whose able work in that department is shown in the pathological reports of the hospital published during his tenure of office. The vacancy has been filled by the appointment of Dr. J. T. Wigham.

Dr. Henry Jellett has been added to the Consulting Staff.

The hospital, in common with all other clinical hospitals, is seriously handicapped by a deficiency of income, which has resulted in a large overdraft to the Bank, all incurred during the last few years of the war and since, in spite of every effort to curtail expenditure and increase revenue. It is to be hoped that the efforts being made at present will result in finding means of stabilising hospital finance, and that the past year has seen the high-water mark in cost of maintenance.

During the year 2,627 patients were admitted for treatment to the maternity wards of the hospital. This is the largest number of patients admitted since the early half of

the last century. Of these 2,149 were delivered and 478 not in labour discharged. This latter figure contains a large number of cases who come in on account of some complication of pregnancy, receive treatment and are enabled to leave hospital for the remainder of their pregnancies. There were 548 patients admitted to the gynæcological wards, making a total of 3,175 cases treated in the hospital during the year. In the extern maternity 1,951 women were attended in their confinements at their own homes, making a total of 5,126 women treated by the hospital, of whom 4,100 were in their confinements.

Extern Maternity.

In the extern maternity 1,951 women were attended during their confinements, and there were seven deaths. Two of these were primiparæ and chronic invalids, one with advanced pulmonary tuberculosis, the other with chronic cardiac disease. Two cases of eclampsia were attended in their own homes, on the routine lines adopted in the hospital, they came into labour, were delivered and recovered. Other cases of eclampsia in the district were moved into hospital and come into the intern report. I prefer that all cases of eclampsia should be brought into hospital, as it is almost impossible fully to carry out treatment and efficiently watch the cases in their own homes, particularly for the first few days after the attack is over. This may be claimed as a detraction against the eliminative treatment by advocates of more radical methods, but the same applies in a more marked degree against operative measures, and if treatment must be carried out in the patient's own home the eliminative will entail by far the lesser inherent risk.

Intern Maternity.

During the year 2,627 patients were admitted and 2,149 confined in the hospital, 2,126 infants being born, of whom 2,025 were alive.

Mortality.

Seven deaths occurred in the maternity, one the result of severe burns all over the body, arms, head and thighs, the result of her clothes catching fire. She was sent into the Rotunda from a general hospital as she was at term, and

delivered herself next day of a dead child. One case died on the 32nd day postpartum from cardiac disease; she had failing compensation all through, which became more marked on the tenth day and never responded to treatment. A third case died of pulmonary embolus on the day of delivery following manual removal of the placenta for P.P.H. The other four cases were toxæmias of pregnancy, and are better reported in detail.

(1) E.R. 35, VII.—Admitted with history of severe vomiting for three months and black vomit for last ten days. On admission temperature 96, pulse 140, very marked œdema, urine only one ounce secreted in 24 hours. The bowels had been confined for five days. The abdomen was larger than normal term, with history of 34 weeks' pregnancy. Lavage of stomach and colon carried out with good result and submammary infusion of sodii bicarb. After 24 hours condition slightly improved, but as vomiting continued and the kidneys had not resumed any action Cæsarean Section was done and dead twins extracted. During the next 24 hours the condition improved markedly, and 10 ounces of urine were secreted, but signs of pneumonia appeared and rapidly developed as typical double lobar. The patient died on the third night after operation. The œdema had disappeared, the bowels acted well and urine was being secreted freely.

(2) S.S. 32, I., Term.—Stated she had passed very little urine for the past few days. There was marked general œdema and a fair quantity of urine loaded with albumen. The abdomen was enormously enlarged, the uterus firm, regular and tense; the foetus was difficult to palpate owing to the patient being very fat as well as œdematous, but there was no evidence of hydramnios, and the head had entered the brim well. There was marked pulmonary and cardiac distress from pressure. The general condition improved during the next two days on water only and purgation; the albumen diminished and secretion of urine was good. Labour then started, but was poor and intermittent. At the end of 24 hours the os was only half dilated; very little advance in the next 24 hours, and the urine dropped to 27 ounces. The pulse, which had been 120, gradually came down to 88 after morphia and rest. Labour improved during the next 24 hours and the head came down to the perinæum; 55 ounces of urine were secreted. It was decided to complete delivery, but while giving æther the patient ceased to breathe and could not be resuscitated. P.M. delivery was done, and a macerated hydrocephalic foetus weighing 12 lbs. 15 oz. extracted. In this case the mistake was made of taking the large size of the uterus as due to multiple pregnancy, but the fat of the abdomen and tenseness of the uterus made definite palpation impossible. The patient had not been able to lie down, and it was probably get-

ting her to do so for the anæsthetic that caused the cardiac failure.

(3) E.G. 36, I.—36 weeks; admitted having had 5 fits. Routine treatment and $\frac{1}{2}$ grain of morphia given. Fits continued, and in the next 13 hours there were 21 fits. Morphia in $\frac{1}{4}$ -grain doses repeated to $1\frac{1}{2}$ grains in first 6 hours. Rectal lavage repeated in 6 hours and again in 12 hours with copious results. The fits ceased 2 hours after the second lavage and patient settled down to quiet and nearly normal sleep. Labour had started, and delivery of a breech was completed 6 hours after the last fit. The third stage lasted $1\frac{1}{2}$ hours and had to be completed manually, ten ounces of urine being drawn off at the time. The patient was greatly improved, semi-conscious, but very inclined to sleep. She was a good colour, breathing regularly and freely. Four hours later she was noticed congested, respiration stopped and could not be restarted. No fits had occurred for $10\frac{1}{2}$ hours; œdema had diminished and secretion of normal-looking urine had commenced. No morphia had been given for 14 hours, and the bowels were acting spontaneously. P.M. showed kidneys congested and enlarged, liver with numberless minute hæmorrhages on surface and through substance, lungs very collapsed, quite free from œdema, subperitoneal hæmorrhages over cæcum and in patches on colon.

(4) J.L. 32, I.—Admitted after 5 fits comatose. Routine treatment and morphia $\frac{1}{2}$ grain repeated in $\frac{1}{4}$ -grain doses to $1\frac{1}{4}$ grains in next three hours. Rectal lavage repeated in 6 hours and again in 6 hours with good result both times. Only $2\frac{1}{2}$ ounces of urine secreted in 9 hours. Thirteen fits occurred in 8 hours, after which they ceased. Very quiet labour set in and delivery was completed 3 hours after last fit. The pulse, which had been 110-120, then came down to 100. Respirations had been down to 12, but after delivery were 14-16. After delivery the patient seemed very satisfactory, semi-conscious and sleeping profoundly. Five hours after delivery and $8\frac{1}{2}$ hours after the last fit the patient was noticed a bad colour with respiration stopped and could not be resuscitated.

I have seen these last two cases 3 and 1 hours respectively previous to death, and was perfectly satisfied with their conditions. Both had a large number of fits, but were showing definite signs of returning consciousness. One had been given $1\frac{1}{2}$ grains, the other $1\frac{1}{4}$ grains, of morphia, but none for 12 or 14 hours before death. I learned afterwards that one of the cases had been noticed a bad colour by the staff nurse, who gave the patient a shake, whereupon she started breathing again quite satisfactorily and became a good colour at once. Both these cases were under special, but I am

afraid not observant, care of students and probationers, besides the light in the ward was very shaded. I believe both deaths were due to suffocation, which could have been prevented, only a shake or the compression of the chest being required to clear the larynx. Such cases should be watched in a good light and the respiration constantly noted, as after the toxæmia has been relieved, and particularly after delivery, they tend to sleep very profoundly, and if the respiration becomes obstructed they do not make any effort to clear it or show any sign of distress, very much like a patient under deep anæsthesia, and if not noticed at once die quietly of CO₂ poisoning. I believe both these cases were already dead from this cause, and possibly for some minutes before notice was taken of their state.

Presentations.

Amongst the cephalic presentations there were 24 persistent occipito-posterior, only five of which required to be completed with forceps. There were eight face presentations, four followed normal mechanism, one was converted to a vertex by Schatz's method. Two cases were anencephalic. One case in a 5-para was seen 10 days before labour, when the presentation was a third vertex well over the brim; when next seen after some hours' labour with poor pains, a face presentation was diagnosed with the chin in front and allowed to persist. There was a period of inertia and after rest with morphia labour continued. The head did not pass the brim when the second stage was reached; all efforts at conversion to a vertex failed, and as the cord when felt was found not to be pulsating the head was perforated and extracted. Brow presentation occurred four times; one the first of twins was changed to vertex and delivered with forceps. Two were a long time in labour, with membranes ruptured, os fully dilated and the fœtus dead; one was perforated and the other extracted after version, through a contracted pelvis with C.V. 9.3cm. The fourth case also a contracted pelvis C.V. 7.75; Trans. 14cm. had three previous labours:—1st, perforation; 2nd, pubiotomy, alive; 3rd, prolapse of cord, forceps, dead. Labour was induced at the 37th week; after 36 hours' labour, the head was still

free above the brim and had moved from a vertex into a brow; the os was fully dilated, so the head was changed back into a vertex and delivered by high forceps, the child being alive. Eighty-two children were delivered as breech presentations; 65 were primary. Sixty-two children were born alive and seven were macerated. Ten cases were associated with prolapse of the cord, and 11 with placenta prævia. There were six cases of transverse.

Forceps.

Forceps were applied ninety-four times, with one death in a case of eclampsia, 84 living children being born. Seventy-seven cases were 1-para and nine 2-para. High forceps were applied in two cases after pubiotomy and two other cases of contracted pelvis. The indications were:—

Delay in 2nd stage	...	65 cases, 1 child dead
P.O.P.	...	5 „ 1 „ „
Face and brow	...	2 „ 1 „ „
Primary inertia	...	4 „ 2 „ „
Albuminuria	...	4 „ 1 macerated
Eclampsia	...	6 „ 2 child dead
Prolapse of cord	...	1 „ 1 „ „
Contracted pelvis	...	6 „ 1 „ „
Accidental hæmorrhage	1	„

Placenta Prævia.

There were 14 cases of unavoidable hæmorrhage, all the mothers recovered with complete freedom from morbidity. Of the children 8 were born alive. Bi-polar version was done eight times and delivery followed within six hours. One case was well advanced in labour and internal version was done. Three cases in which the bleeding was slight were kept in bed under close observation, allowed to fall into labour naturally and deliver themselves. One of these was the only 1-para in the series. A point which I do not think is sufficiently recognised is the care with which the third stage requires to be conducted in placenta prævia, so as to insure the complete removal of the membranes, which are adherent all over the fundus with the placenta below. The

third stage is frequently immediate, and when prolonged the placenta is often found detached, but held high up in the vagina by the membranes. In these cases I think it is better to pass the hand into the vagina and there to work the membranes off the uterine wall rather than to push the placenta out of the vulva before trying to separate the membranes.

Accidental Hæmorrhage.

Of the seven cases of accidental hæmorrhage six were external and one mixed. One case not in labour was treated by vaginal plugging, and one case thought to be in labour had the membranes punctured, which stopped the bleeding, but labour did not follow for five days, when the child was born alive.

Postpartum Hæmorrhage.

Twenty-eight cases had excessive bleeding during or after the third stage, which called for more than ordinary treatment. Three were secondary hæmorrhage; one in a case of postpartum eclampsia and one after pubiotomy will be referred to under those headings, the third case occurred 12 hours after delivery. All the patients recovered.

Contracted Pelvis.

There were thirty-four cases of contracted pelvis, the actual measurements being taken in 32 with Skutsch's pelvimeter. Nine were 1-paræ and twenty-five multiparæ. These latter had had 35 previous term confinements, eighteen children being born alive, only two spontaneous, one with forceps and the others either after pubiotomy or by section. Thirteen cases were treated by Cæsarean Section, five for the second time. The following case had a curiously irritable uterus:—

J.J. III.—First pregnancy terminated by pubiotomy, second with forceps, came into hospital in labour, with a breech presentation free above the brim, although the membranes were ruptured. The fœtus was turned by external version into a vertex and labour allowed to continue for 71 hours. At the end of this time the head was still free above the brim. Between the pains the cervix was dilated to admit the half hand, but the uterus was highly irritable and at once contracted, the cervix contracting at the same time so as to only just admit two fingers and lifting

the presenting part away from the brim. As the child was alive section was done. The patient had a wholly afebrile convalescence, although the skin failed to unite and had to be resutured on the eighth day, when it healed perfectly.

Another case with a very marked dwarf pelvis was admitted after 36 hours' labour with the membranes ruptured. She was not measured, but the degree of contraction quite precluded pubiotomy; the puerperium was completely afebrile.

Pubiotomy was done on three cases—two for the second time; one done in 1911 had very marked, bony union with some projection on the inner side of the pelvis; the other had been done four days before labour, but the union did not show any tendency to relax. In the third case I did pubiotomy five days before labour started, the head came down slowly through the brim and labour was completed with forceps, having lasted 44 hours. Four days postpartum and eleven days after the pubiotomy a vesico-vaginal fistula developed; this was subsequently closed after three attempts being very difficult to get at. The opening into the bladder was behind the pubis, in which a gap $\frac{3}{4}$ of an inch remained, filled with fibrous tissue. The inner end of the pubic ramus had necrosed and formed a sequestrum. This is the only case in which I have tried so-called prophylactic pubiotomy; and I do not think there is any advantage in the method over doing the operation when the patient has got into the second stage and then completing delivery with forceps. This is the procedure I followed in the other cases, who left hospital on the 11th and 18th days respectively; one was delayed through having a secondary postpartum hæmorrhage on the 5th day from a small vessel in the vaginal wall which caused a considerable hæmatoma before showing externally. All the cases were allowed to do without the belt from the fourth day; one case was allowed out of bed on the 6th day.

Six patients delivered themselves spontaneously, in whom the C.V. was 8.5 to 9 cm., except one with a C.V. 9.7: Trans. 11.3. One of these had a section done at her first confinement and another a pubiotomy done four days before labour started. One case delivered by high forceps had a

complete tear of the perinæum from her first confinement; this was repaired immediately after delivery with good result.

Labour was induced in two cases, at the 37th and 39th weeks; the former had pubiotomy done 18 days before labour with her second pregnancy and prolapse of the cord occurred with her third. The head was free above the brim and remained so into the second stage, when it had moved into a brow, the head was flexed and delivered with forceps. Version was done twice where the foetus was already dead and craniotomy five times in protracted cases which came under treatment with the foetus dead.

Pelvimetry.

Measurements made with Skutsch's pelvimeter are of the greatest value, but they should always be taken under an anæsthetic, so that an estimate may be made of relative size by Müller's method, and the internal transverse measurement should always be taken, as the degree of contraction of this diameter has a very marked and rapidly-increasing influence on labour when in conjunction with flattening. The size of the foetal head and its mouldability are essential points, and these can be best estimated by Müller's method. If this is done after the 36th week the amount of overriding present will give the best grounds to base a line of treatment upon.

Induction of Labour.

In ten cases labour was induced, eight on account of death of the foetus and two for contracted pelvis. I think induction of labour in the last two or three weeks of pregnancy takes a most useful place in the treatment of contracted pelvis, and the selection of cases for it is best done by Müller's method, in conjunction with previous history. The introduction of three bougies was the method usually adopted, the bougies being left in place, even to 60 hours, till labour started; $\frac{1}{2}$ or $\frac{1}{4}$ cc. doses of pituitrin were given after 24 hours in several cases where labour had not set in. In two cases instead of bougies I adopted the introduction of a 30-inch, No. 20 to 24, soft rubber stomach tube; this is the method I have adopted in private for the past ten

years, and always found satisfactory. The tube is easier to sterilise, only requiring to be boiled and is not damaged by boiling. It is pushed through the cervix, and when five or six inches have been passed in, the tube coils of itself, below the presenting part, into rings about three inches in diameter; the whole tube is passed into the uterus and is left there till labour is well established. The method induces labour as well as the bougies, and has the advantage of being confined to the lower part of the uterus and much less risk of rupturing the membranes.

Prolapse of the Cord.

Prolapse of the cord occurred nineteen times, with vertex in 9, breech in 7, and transverse in 3. Ten children were born alive and one was macerated. Three cases were admitted with the cord already prolapsed and two were only discovered when the cord had ceased to pulsate. Internal version extracted two children alive out of three cases. Forceps were applied once, the child being born dead. One transverse and three breech cases resulted in dead children. One transverse, the second of twins, was changed to a vertex, the cord replaced and a living child born spontaneously.

Rupture of Uterus.

Two cases of rupture of the uterus were admitted. Both were treated by plugging the rent and recovered.

S.M.¹ III.—Had two previous Cæsarean Sections on account of contracted pelvis; came into hospital with history of having been in labour for several hours when bleeding started. On the way to hospital had very severe pains, but on admission these had ceased, and although there was evidence of some bleeding having occurred there was none continuing. The temperature was 96, pulse 72. There was slight abdominal tenderness, no uterine contractions; the pregnancy corresponded to the 34th week, and the foetus was lying transverse. The patient was sallow and looked toxæmic. After an enema all pain ceased. The condition was thought to be toxæmic and treatment adopted on this line. After seven days, the foetus being obviously dead, it was decided to empty the uterus. When the cervix was dilated sufficiently to admit two fingers, it was found that the uterus was ruptured

¹ Reported fully in "Dublin Journal," Sept., 1920.

and contracted, with the fœtus in the abdominal cavity. The fœtus was extracted by embryotomy, the pelvis douched in sitting posture through the rent and a loose gauze drain inserted. The patient left hospital quite well on the 16th day.

A.M. II. was delivered of the first of twins six hours before sending to hospital; when seen a neglected shoulder presentation was found, labour having completely ceased for some time. Version was easily done under anæsthesia, when it was found that the uterus was ruptured through the cervix and posterior fornix. The patient did not show much shock; a bunch of gauze was passed through the rent and partly removed next day and completely in 48 hours. There was some meteorism on the 3rd day, and the temperature rose to 100 on the 4th and 5th days, otherwise the puerperium was afebrile, and the patient left hospital on the 12th day.

Eclampsia.

There were thirteen cases of eclampsia—2 ante partum; 1 ante partum and during labour; seven during labour, and three postpartum, with two deaths. These are recorded as Nos. 3 and 4 under mortality. One fœtus was macerated, two were born dead and ten were born alive, but two of these were seven to ten weeks premature, and died on the 11th and 3rd days after birth. The treatment adopted was that introduced by Dr. Tweedy. The only modification I feel inclined to make is in not pushing the morphia after the first grain has been given and lavage of stomach and colon completed for the first time and a large purgative introduced. This latter I consider the curative part of the treatment, and now adopt as a routine the washing out of the colon in five or six hours after the first lavage and again after the same interval. After the first lavage in most of the cases there appeared to be an increase of toxæmia, as shown by coma, œdema, and occurrence of fits; but improvement began when the second washing out of the colon was done. Even in those cases in which a copious result is obtained with the first, the second wash out produces a vastly greater result; after that, as a rule, the bowels take on spontaneous action, but even when this does occur I think washing out should often be repeated for the third time. In the cases that died morphia was given to $1\frac{1}{2}$ and $1\frac{1}{4}$ grains in six and three hours, but fits continued to occur with undiminished frequency until after the second

lavage. Two cases had very marked dimness of vision, and this symptom persisted for several days after all others had cleared up, but finally the sight became quite normal. I give the notes of two cases.

K.G. II. developed postpartum eclampsia with three fits, the first 13 hours after delivery; was kept on water only for 6 days, as the kidneys were unusually slow in resuming action. Rectal lavage was done twice, after which the bowels were kept moderately free with purgatives and the patient was able to take fluid freely by the mouth. Muscular twitchings were marked and continued for 4 days, and the patient complained of almost total blindness for 6 days. Diuresis started on the 6th day. On the seventh day a free hæmorrhage occurred, and a large quantity of old blood clot was expressed apparently from the uterus; the fundus was well contracted, but had been all along too high. A few hours later some more bleeding occurred, and I started to douche the uterus; it was still well contracted, and only a little more clot came away. While doing this free bleeding was noticed coming from the urethra. On passing a catheter about an ounce of bloody urine came from the bladder and the urethral bleeding continued. The bladder on bi-manual palpation was found greatly thickened. For the next 24 hours what came from the bladder was largely blood containing numbers of small blood clots which appeared to be several days old. During the next 12 hours the urine passed was much less bloody, but contained an increasing quantity of old blood clot all in small pieces. The clots all came from the bladder after the uterine douche, the lochia containing very little blood. The urine from this time gradually cleared and was quite normal in four days.

I believe this was a case of toxæmic hæmorrhage into the parametrium between the uterus and bladder. The case was a mild one of eclampsia, but very marked toxæmia, as shown by the slow recovery of the kidneys and severe retinitis.

T.W. I. was sent in with a history of six fits a week previously and two the day before admission, and of having been kept on water only for a week. She was very mentally disturbed, had marked loss of sight and general œdema.

The bowels were very confined. Treatment consisted of free purgation, soda bicarbonate by the mouth and poultices to the loins. This was continued till after delivery, 15 days after the first fits. The general condition improved slightly under treatment and then remained stationary, except for the development of epistaxis for several days. The child was born alive.

Toxæmic Albuminuria.

Besides those patients that developed fits and so appear in the table of eclampsia, there were 15 others admitted in an advanced pre-eclamptic state, eleven primiparæ and four multiparæ. Œdema was marked in all, very marked in seven and amounting to anasarca in one multipara. The urine was loaded with albumin in eight, and albumin was present in large quantity in all except the case of anasarca. The quantity of urine secreted in 24 hours was reduced to 12 to 25 ounces in all but four, the anasarca case passing 31 ounces and three others 40 or more ounces; two of these were primiparæ. Granular and hyaline casts were found in all examined for same and R.B.C.'s in most. Of the symptoms, headache was very severe in three cases, associated with dimness of vision in two and vomiting in one; this was also a marked symptom in another case. One case was profoundly drowsy and two had ante partum hæmorrhage; one of these was with her XI. pregnancy, and labour had to be induced at the 22nd week on account of the bleeding, her previous pregnancy having been terminated by C.S. for concealed hæmorrhage. She has again been in hospital with another pregnancy which had to be terminated at the 16th week on account of hæmorrhage and albuminuria. Labour was induced in one other case, a primipara, at the 29th week after she had improved, the foetus being obviously dead, and macerated when born. These cases were all treated by water diet, free purgation and soda bicarbonate by the mouth. Nine children at or near term were born alive; two at the 36th and 39th weeks were born dead; twins at the 32nd week were born alive, but died; one at the 28th week was born alive, but died. Two at the 32nd and 28th weeks were macerated. With the exception of the two cases referred to, labour was allowed to come on spontaneously.

Pyelitis.

Three patients had severe pyelitis during pregnancy, for which they were treated in hospital and subsequently delivered. The treatment consisted of a very light diet, plenty of water to drink and citrate of soda in half drachm doses, four to six hourly. Urotropin was given in two cases, but discontinued, as I did not think there was any additional benefit from it. The pus disappeared from the urine in all cases after delivery. One other case was treated on two occasions and allowed to leave hospital improved; she returned a third time this year with a relapse and was delivered 10 days later. The temperature came down to normal after 14 days and the pus in the urine diminished; after leaving hospital it increased, but has again improved.

Morbidity.

The morbidity for the year estimated by the B.M.A. standard gives a percentage of 6.98, which is somewhat above the average for previous years. This is altogether due to the very high number of extra-genital cases. By the Rotunda estimate the percentage is 4.0. In reality, the year was very satisfactorily free from genital infection, as shown by the fact that only 37 cases had a duration of temperature over 5 days; only twenty-eight cases required utero-vaginal douching and only ten of these had more than one douche. There were no deaths from sepsis. In 113 cases the duration of the temperature was under 5 days; in 29 cases 5 to 9 days, and in 7 cases 10 to 19 days. Four cases received vaginal douches only; in eighteen cases the uterus was douched once; in three cases, twice; in two cases, three, four and six times; and in one case, twelve times. Streptococci were found in smear or culture in 5 cases; three of these were treated with stock vaccine and two with stock and autogenous vaccines. Two cases showed staphylococci; one showed streptococci and bacillus coli; in one case no organism was found. All these cases were given stock vaccines, and all received one to three injections of antistreptococcus serum in 20cc. doses. Four cases were given only one injection of vaccine; two cases were given three injections; two were given five injections, and one case was

given nine. Twenty-two cases were treated by applications to the perinæum only.

The administration of antistreptococcic serum in 20cc. doses was adopted in all cases suggesting infection with pyogenic organisms, the injection being repeated in 24 to 48 hours and again in 2 days, but not persisted in beyond that. Stock vaccine was given in cases receiving a second dose of serum and autogenous vaccine when obtained if still required. Uterine douching was resorted to early in most cases, and I believe it is better to risk douching in cases where the uterus is not at fault than to delay it in cases of uterine infection. Two of the more serious cases were for several days thought to be so definitely extra-uterine that the douche was not given for several days after the rise of temperature, when the morbidity was found to be uterine in origin, and I believe if the douche had been given earlier the disease might have been stopped in the stage of sapræmia. Besides the above treatment all cases showing a rise of temperature are got to sit up in bed frequently during the day, to go on to their hands and knees to micturate, or to even get out of bed for this and for defæcation. I think this method of promoting uterine drainage is of the greatest importance and far more to be depended upon than the mere elevation of the top of the bed, which, to my mind, can never be sufficient to drain the uterus. With regard to vaccines, I think stock vaccines should always be used, and particularly those which appear to give a reaction. The delay in obtaining autogenous vaccines reduces their use; in the majority of cases the need for vaccine had passed before it was obtained. A vaccine made from a protracted case of infection is used for stock.

Other Complications.

There were three cases of hydramnios. From one case 20 pints of liquor amnii were removed, and the patient delivered herself of a normal child in asphyxia, which could not be resuscitated. The other two cases were associated with anencephalus or spina bifida. Three cases of hydatidiform mole occurred. One case was admitted three months later to the gynæcological wards with a chorion-epithelioma for which hysterectomy was done.

One case of chorea was treated at about the 20th week of pregnancy; the condition was very marked with general movements of trunk and limbs, most marked in the arms. The patient gave a history of having had chorea during childhood. She was treated with large doses of arsenic and improved considerably, when she was allowed to leave hospital and attend dispensary. She returned at about the 26th week and was delivered of a macerated foetus. The chorea having disappeared, there was never any albumen in the urine.

A very marked case of dermatitis herpetiformis was admitted a few days before term. The whole trunk, arms, thighs, and buttocks were covered with erythema and bullæ; the labia were very œdematous. The rash had developed rapidly about three weeks previously. The patient was delivered of a living, healthy infant. On the 2nd day the temperature rose above normal and reached 102.6 on the third evening, after which it persisted from 99 to 100 with the pulse from 80 to 100 for the next 20 days. The condition of the skin began to clear almost immediately after delivery, and was normal at the end of a week. The lochia was normal all through and a culture proved negative; the uterus involuted well. On the 18th day the patient complained of pain in the right iliac region, and there was definite rigidity; this increased during the next two days, and it was thought that an appendix abscess had developed. By vaginal examination a mass could be felt on the right side clearly detached from the uterus, which was quite mobile and well involuted. The abdomen was opened and an abscess of the right ovary found adherent above the pelvic brim; the rest of the pelvic organs were perfectly normal.

Two patients were delivered of living children, who had been treated for syphilis during their pregnancies. One had had two previous dead children; the other had had five dead children and two born alive, but dying in a few days. These were amongst the earlier pregnancies. The treatment adopted was injections of N.A.B. 0.6 gram doses at weekly intervals and hydrarg perchlor 1/16 grain by the mouth three times a day. The babies showed no evidence of disease.

Fœtal Complications.

There were eight cases of melæna neonatorum. In several cases the infant was profoundly anæmic, and all showed evidence of loss of blood. All were treated by injections of normal horse serum in single doses of 10ccs., and all recovered. Seven cases of ophthalmia developed; in five a pure culture of gonococci was found; one showed a pure culture of staphylococcus aureus and one was negative. The application of silver nitrate is carried out as a routine prophylactic after birth and also in the treatment, with the maintenance of free drainage by the application of a few drops of flavine in castor oil 1/1,500 two or three times a day. Free drainage I think is of great importance in preventing serious complications. One case developed corneal ulceration of both eyes with perforation of the anterior chamber in one eye, although treatment was started at the earliest indication of the infection and carried out with all possible care.

Three infants were born with depressed fractures of the skull. In all the depressed bone was lifted by means of one blade of a bullet forceps pushed through the bone and used to pull up the depression, as described by Dr. Tweedy. The method worked perfectly. One case was after forceps delivery following pubiotomy; the other two occurred in breech extractions, where rapid delivery was required on account of prolapse of the cord, Martin's method being adopted for the aftercoming head, and the fracture in both cases was in the frontal bone.

One case of hydrocephalic head had to be perforated and $2\frac{1}{2}$ pints of fluid were evacuated. Another had a meningocele through the occipital bone nearly as large as the head, which prevented the head engaging, and was extracted as a breech. An infant operated upon for intestinal obstruction showed complete failure of development of the large intestine, but there was an inch of anal canal.

The case of triplets was composed of a fully-developed term child associated with two very compressed fœtuses which appeared to be of about 16 weeks' development, which came away with a separate placenta and set of membranes.

GYNÆCOLOGICAL REPORT, 1919-1920.

DURING the year 549 patients were admitted to the gynæcological wards, 431 underwent operation and 170 laparotomies were performed.

In opening the abdomen a mid-line vertical incision is nearly always made; a transverse incision was used in a few cases, chiefly with the object of opening up the inguinal canal and dealing with a hernia in that region at the same time as doing intra-pelvic work. In retroversion of the uterus a modified Gilliam's operation is done where the retroversion is the principal fault, but at the end of long operations for other severe pelvic disease or where pelvic drainage is necessary, a simple ventral suspension is adopted. When pelvic drainage is required, I prefer to drain through the lower angle of the abdominal wound. I have never found any disadvantage in this route and subsequent attention is easier. I use a rubber tube and a narrow strip of gauze outside the tube; the gauze is removed next day and the tube taken out and replaced. The only vaginal drainage I adopt is that of the pelvic parametrium extra-peritoneally, in Wertheim's hysterectomies. Catgut is used throughout all operations except Cæsarean Section, where silk is used for the closure of the uterus and in closing the skin, which is always done with silkworm gut. The catgut is prepared in a solution of iodine, 1 in 600, in methylated spirits. Two 10-foot strands are wound loosely on holders and a number of these placed in the iodine solution for at least three weeks before being used, being stored in the solution in which it is prepared and only taken out when required. I have used catgut prepared in this manner for the past ten years, and have never had any reason to doubt its sterility. The method is simple, and there is no degeneration in the strength of the catgut. Thirty-four patients were operated on for fibroids, hysterectomy being done in those over 40 as a rule and myomectomy in younger women and those desiring the possibility of pregnancy. Vaginal hysterectomy was done in four cases of prolapse, although I do not think it is as efficient a manner of dealing with that condition as the operation of suspending the cervix by shortening the

pelvic fascia, which I describe as radical cure of prolapse. One of these cases was associated with fibrosis of the uterus causing marked symptoms; one had a previous extensive colpoperinæorrhaphy done; one had a very indurated spot in the cervix which made the retention of the uterus inadvisable, and one was a patient, aged 68, with complete inversion of the vagina as well, which had existed for years and was very ulcerated. In this case extirpation of the vagina was also done. The operation has relieved the patient of the presence of an ulcerated tumour outside the vulva, but has not cured the urethral incontinence of urine from which she also suffered. In the other cases the tissues separated from the uterus were all firmly implanted into the top of the vagina, the pelvic fascia being shortened in doing so, and the result has been very satisfactory. Twelve cases of carcinoma of the uterine cervix were admitted; all were in an advanced stage of ulceration, and five were deemed inoperable. In three, after the abdomen was opened, the disease was found so far advanced as to prevent any attempt at removal.

The following cases contained some points of particular interest:—

Inversion of Uterus from Fibroid Polypus.

20215. Single. Aged 35.—General health good and menses regular until four months before admission to hospital; since then almost continuous bleeding. Polypus size of golf ball found in vagina, with thick pedicle through cervix. Uterus slightly enlarged and normal shape. After dividing base of polypus with scissors, the finger was found to pass into the abdominal cavity. Anterior colpotomy done, uterus brought down and hole in fundus sutured.

Ruptured Ovarian Cyst.

20288. Aged 46. 2 para.—Enlargement of abdomen for past eleven months; very marked increase in last three months. Abdomen size of term pregnancy, large mass palpable. Per vagina, uterus small antiflexed, nothing else to be felt. Laparotomy, when the abdomen was found filled with mucinous material, which had evidently come from a small hole in one cyst of a multi-locular ovarian cyst, the size of about a five months' pregnancy. Ovariectomy done and abdomen closed.

Hysterectomy and Cure of Inguinal Hernia.

20456. Aged 55. 5 para.—Inability to micturate for past week. Old standing left inguinal hernia. Posterior vaginal wall pushed down by cystic tumour impacted in Douglas's pouch. Abdomen opened by Phannensteil's incision, so as to open up the left inguinal canal. Large cystic tumour intraligamentous in origin found to have grown extra-peritoneally and filled the pelvis below Douglas's pouch, lifting uterus and appendages and peritoneum above it. Supra-vaginal hysterectomy done and tumour shelled out. Hernial sac freed from canal and hernial opening closed with the closure of the fascia in the ordinary manner.

Papillomatous Ovarian Cyst with Extension to Tube.

20489. Aged 37. 6 para.—Pain in left side since last confinement seven months previous. Lacerated perinæum uterus retroverted and cystic mass size of hen egg in Douglas's pouch. Anterior colpotomy, right ovariectomy, and as there was a papillary growth on outer end of tube it was also removed. Vaginal suspension and repair of perinæum done.

Pathological report; the growth on tube composed of branching papillæ covered with a single layer of high columnar epithelium. The ovarian cyst composed of two or three loculi showed similar papillæ to those about end of tube.

Hysterectomy for Fibroids.

20498. Aged 42. Single.—Very anæmic from constant bleeding for some months. Uterus size of two months' pregnancy with fibroid size of large egg protruding through cervix. Total hysterectomy, some difficulty in getting uterus away owing to size of fibroid in vagina.

Fundal Carcinoma.

20509. Aged 50. 4 para.—Pain in left side for seven weeks, discharge for five weeks, bleeding two weeks. Cervix nodular, no ulceration, fundus small, bled on examination, mass extending into broad ligament. Laparotomy. Fundus firmly adherent to back wall of pelvis. Friable material filling Douglas's pouch. Pyometra probably extending into broad ligament. Quite inoperable owing to involvement of pelvic structures.

Pregnancy with Ruptured Ovarian Cyst.

20588. Aged 26. Mar. 7 months.—Noticed swelling in right groin four months previous with severe pain. General abdominal pain since and vomiting. Abdomen enormously enlarged. Fœtal parts felt over pubis. Laparotomy, peritoneum much thickened, tumour adherent all over abdominal walls and to intestines, large quantity of mucinous fluid all through abdomen. Three and a half gallons of fluid evacuated, cyst removed. Labour set in next day and ended with six months' miscarriage.

Uterus Unicornis.

20589. Aged 25. Sterile.—Pain in left side and irregular menses for two years. Hæmorrhage for ten weeks. Erosion of cervix. Fundus retroverted and drawn to right. Appendages palpable. Ovaries enlarged and cystic. At laparotomy uterus found developed from right tube. Both tubes well developed. Left tube attached low down to side of fundus by elongated mass of tissue. Both ovaries very cystic. Ovaries resected.

Adenoma of Uterine Fundus.

20613. Aged 50. 3 para.—Sent in as curettings showed adenomatous growth. Pelvic organs appeared quite normal on examination. Pan-hysterectomy. What endometrium was left in uterus showed papillary outgrowth, but there was no evidence of infiltration.

Chorion-Epithelioma following Hydatidiform Mole.

20626. Aged 36. 3 para.—Vesicular mole removed five months previously. Bleeding for four months, very profuse before admission. Uterus slightly enlarged. Curettage. Very little got away, bleeding profuse. Some white necrotic tissue removed. Fundus very rough at left cornu. The scrapings showed no endometrium, but pieces of muscle tissue with irregular cell masses suggestive of syncytium. Total hysterectomy. The uterus had several necrotic cavities on its mucous surface and several patches of necrotic tissue embedded in the wall near the left cornu. Sections showed no trace of chorion, but several patches of decidual like tissue with large isolated cells.

Hæmatometra.

20636. Aged 60. Single.—Soreness of external genitals, slight bleeding for one week. Abdomen enlarged to size of term pregnancy. Uterus felt semi-cystic. Laparotomy. Uterus punctured as too large to remove whole. Large quantity of old fluid blood evacuated. Uterine wall $\frac{3}{4}$ to 1 inch thick. Hysterectomy. The interior of uterus showed many degenerated submucous fibroids.

Adenoma of Uterine Fundus.

20698. Aged 30. Single.—Metrorrhagia for a long time. Fundus enlarged and hard. Laparotomy. Uterus suggested a fibroid in posterior wall. Incision into uterine wall showed no tumour, but wall thickened; on opening cavity a polypoid mass suggestive of sarcoma projected. Total hysterectomy. Uterus showed very marked hypertrophy of endometrium in parts adenomatous. No infiltration.

Chorion-Epithelioma following Hydatidiform Mole.

20738. Aged 38. 5 para.—Six weeks after removal of mole

bleeding started, very severe at times, and lasting three months. Uterus curetted; scrapings reported to be malignant. Total hysterectomy. The cavity of the uterus showed necrotic and ulcerated patches. Sections of the wall showed infiltration of the muscle with masses of decidual like tissue and many large single cells and masses of syncytial like cells.

Gilliam Suspension and Femoral Herniotomy.

20744.—Complained of swelling in groin. Uterus retroverted. Hernia in left inguinal region. Abdomen opened by Phannensteil's incision so as to open inguinal canals. Hernia found to be femoral. Peritoneum stripped off front of pelvis to left side, so as to expose upper surface of Poupart's ligament. Hernial opening closed by sutures through Gimbernat's and Poupart's ligaments. Round ligaments drawn up and sutured into inguinal canals.

INTERN DEPARTMENT.

TABLE NO. I.

	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sep.	Oct.	Total
Total deliveries .	201	176	194	196	162	185	195	196	178	174	177	115	2149
Patients not in labour .	25	29	51	40	53	43	64	42	32	34	30	35	478
Total admissions.	226	205	245	236	215	228	259	238	210	208	207	150	2627

TABLE No. II.

Total Admissions	2,627	Operations—	
Deliveries	2,149	Pelvimetry	11
Primiparæ	888	Induction of Labour :—	
Multiparæ	1,261	for dead foetus	8
Presentations—		„ contracted Pelvis	2
Vertex (normal)	2,002	Suture of Perinæum—	
„ (Occ. Post.)	24	Incomplete	650
Face	8	Complete	2
Brow	4	Suture of Cervix	4
Breech	82	Forceps	94
Transverse	6	Version	21
Twins	33	Cæsarean Section	14
Triplets	1	Pubiotomy	3
Complications of Pregnancy—		Perforation	2
Hyperemesis	1	Craniotomy	5
Vesicular Mole	3	Decapitation	1
Hydramnios	3	Embryotomy	1
Abortions, etc.	53	Cleidotomy	2
Hæmorrhages—		Manual Removal of Placenta	28
Unavoidable	14	Morbidity (B.M.A. standard)—	
Accidental (External)	6	Average 1 in 14.32	
„ (Mixed)	1	Percentage 6.98	
Post-partum	28	Mortality	7
Hæmatoma Vulvæ	1	Percentage 0.325	
Rupture of Uterus	2	Fœtal Abnormalities—	
Laceration of Perinæum	650	Anencephalus	3
„ „ (complete)	1	Hydrocephalus	3
Adherent Placentæ	19	Spina Bifida	4
Prolapse of Cord	19	Talipes	2
Contracted Pelvis	34	Meningocele	2
Accidental Complications—		Congenital Occ. of Intestine	1
Epilepsy	2	Supernummery Digits	2
Phthisis	2	Intrauterine Amp of Arm	1
Myomata	2	Exomphalos	1
Chorea	1	Infantile Complications—	
Albuminuria	46	Cephalhæmatoma	5
Cardiac Disease	2	Fractured Clavicle	2
Prolapse of Cervix	1	Depressed Fract. of Skull	3
Pyelitis	3	Melæna	8
Eclampsia	13	Ophthalmia	7
Insanity	2	Meningitis	2
General Burns	1		

EXTERN MORTALITY.

Name	Age and Para	Cause of Death	Time Ill	Remarks
H. C.	36 VII.	Pyelitis Sepsis Pneumonia	14 ^r days	B.B.A. Placenta complete Temp. from first day and Pneumonia definite 3rd day.
M. G.	32 VI.	Hæmorrhage	4 hours	6½ months pregnancy. Ad- herent placenta Manual removal.
M. C.	32 I.	T.B. Broncho- pneumonia	Through pregnancy	Died 14 days post-partum.
M. R.	25 III.	Hæmorrhage	Few hours	B.B.A. Placenta partially expressed before sending to hospital. Manual removal.
M. McG.	? ?	Ext. Acc. Hæm.	1 day	Bleeding 18 hours before seen, stopped and re- curred. Vagina Plugged, Labour in 2 hours, no more bleeding, spontan- eous delivery, Post- partum hæm, Man. re- moval, Uterus plugged, secondary collapse twice.
B. B.	29 IV.	Hæmorrhage Unavoidable	?	Bleeding 3 weeks before, died a few minutes after arrival of Assistant.
A. O.	25 I.	V.D.H.	?	Died 5 days post-partum.

Name	Age	Para	MEASUREMENTS		Presenta- tion	Mode of Delivery	Result to Mother	Result to Child	Weight of Child	Remarks
			C. V.	T.						
E. M.	30	II.	5.5	—	Vertex	Craniotomy and Cleidotomy	Re- covered	Macer- ated	7 lbs.	1 Cæsarean Section, admitt- ed in strong labour. Os $\frac{1}{2}$ dilated. No Fœtal heart.
C. C.	32	VI.	8.5	12.7	Vertex	Pubiotomy and Forceps	Re- covered	Alive	6 $\frac{1}{4}$ lbs.	4 abortions, 1 still-born, full term. Outlet contrac- tion Antero posterior 8.8 cms. Transverse 8.25 cms. Started labour 5 days after pubiotomy. Vesico-Vaginal Fistula appeared 4 days after delivery.
E. D.	29	III.	8.0	12.3	Antr. Parietal	Craniotomy	Re- covered	Dead	4 $\frac{1}{2}$ lbs.	1 abort. 1 Pubiotomy; admitted in labour 91 hours. Threatened Rup- ture of Uterus. Forceps tentatively. No Fœtal heart.
M. M.	28	I.	5.5	11.0	—	Cæsarean Section	Re- covered	Alive	6 $\frac{7}{8}$ lbs.	—
M. O'H.	24	II.	8.5	—	Vertex	Spontaneous	Re- covered	Alive	7 $\frac{5}{8}$ lbs.	1 Pubiotomy.
A. O'R.	24	II.	8.5	—	Vertex	Spontaneous	Re- covered	Alive	7 $\frac{1}{2}$ lbs.	1 Spontaneous.
S. H.	25	II.	8.75	—	Vertex	Spontaneous	Recovered	Alive	6 $\frac{1}{2}$ lbs.	Cæsarean Section.
S. M.	30	III.	9.	11.2	Transverse	Embryoto- my after Rupture of Uterus	Re- covered	Dead	6 lbs.	2 Cæsarean sections. <i>Vide</i> Rupture of Uterus.
A. O'M.	30	II.	7.1	—	Antr. Parietal	Cæsarean Section	Re- covered	Alive	6 $\frac{5}{8}$ lbs.	1 Breech dead.
J. J.	26	III.	8.75	—	Breech	Cæsarean Section	Re- covered	Alive	5 $\frac{1}{4}$ lbs.	(1) Pubiotomy spontan- eous; (2) Forceps. 71 hours in labour. Head not fixed. <i>Vide</i> Con- tracted Pelvis.

TABLE No. V.—*Contracted Pelvis.*—*continued.*

Name	Age	Para	MEASUREMENTS		Presenta- tion	Mode of Delivery	Result to Mother	Result to Child	Weight of Child	Remarks
			C. V.	T.						
C. K.	29	IV.	7.75	14.0	Brow	Forceps after Induction of Labour	Re- covered	Alive	5½ lbs.	(1) Perforation; (2) Pubiotomy spontaneous; (3) Prolapse of Cord. Labour induced at 37th wk. Changed to Vertex. Forceps.
S. W.	25	II.	7.7	—	Postr. Parietal	Forceps after Pubiotomy	Re- covered	Alive	7¾ lbs.	1 Pubiotomy. Admitted, os fully dilated, Head not fixed. Changed to vertex and forceps tried. Pubiotomy performed on opposite side to previous.
K. C.	24	I.	9.3	—	Brow	Version	Re- covered	Dead	7 lbs.	Changed to vertex. Forceps failed. Version.
M. D.	22	II.	7.8	11.8	Postr. Parietal	Forceps	Re- covered	Alive	6 lbs.	1 Dead born. Admitted 27 hours in labour; head unfixed.
E. F.	24	III.	9.0	—	Vertex	Spontaneous	Re- covered	Alive	8½ lbs.	(1) Perforation 54 hours; (2) Macerated. Head high above brim.
M. O'N.	20	I.	9.0	10.5	—	Cæsarean Section	Re- covered	Alive	7½ lbs.	—
E. S.	21	I.	7.2	10.0	—	Cæsarean Section	Re- covered	Alive	7¼ lbs.	—
M. S.	36	V.	9.25	11.25	Vertex	Forceps	Re- covered	Alive	6¾ lbs.	(1) Pituitrin still-born; (2) and (3) Forceps, lived a few minutes; (4) still-born.
S. F.	28	II.	7.7	11.4	Vertex	Cæsarean Section	Re- covered	Alive	7½ lbs.	1 Forceps, dead. 12 hours in labour, membranes ruptured.
E. M'K.	26	II.	7.0	—	—	Cæsarean Section	Re- covered	Alive	7½ lbs.	1 Cæsarean Section.

Name	Age	Para	MEASUREMENTS		Presenta- tion	Mode of Delivery	Result to Mother	Result to Child	Weight of Child	Remarks
			C.V.	T.						
C. H.	20	I.	8.0	—	Vertex	Version	Re- covered	Dead	7 $\frac{3}{8}$ lbs.	In labour 24 hours before admission, membranes ruptured. Version. 1 Cæsarean Section.
K. C.	22	II.	—	—	—	Cæsarean Section	Re- covered	Alive	6 $\frac{1}{2}$ lbs.	1 Cæsarean Section.
S. S.	29	II.	8.25	10.0	—	Cæsarean Section	Re- covered	Alive	6 $\frac{5}{8}$ lbs.	1 Cæsarean Section.
M. M.	35	II.	9.25	13.0	Antr. Parietal	Forceps after Pubiotomy	Re- covered	Dead	6 $\frac{1}{2}$ lbs.	1 Pubiotomy. 26 hours in labour, forceps failed. Pubiotomy performed on opposite side.
M. F.	22	I.	8.5	—	Vertex	Spontaneous	Re- covered	Alive	6 $\frac{5}{8}$ lbs.	Head not fixed at beginning of labour.
C. D.	28	II.	7.5	13.0	Vertex	Perforation	Re- covered	Dead	7 lbs.	1 Forceps, dead. Head not fixed after 50 hours labour. No Fœtal heart heard.
M. R.	25	I.	7.8	11.2	Postr. Parietal	Craniotomy	Re- covered	Dead	6 $\frac{5}{8}$ lbs.	Fœtus dead. Head still not engaged after 36 hours.
B. M.	24	I.	9.7	11.3	Vertex	Spontaneous	Re- covered	Alive	8 lbs.	Head not fixed at beginning of labour.
M. S.	27	IV.	7.0	13.2	—	Cæsarean Section	Re- covered	Alive	5 $\frac{5}{8}$ lbs.	1 Cæsarean section.
M. S.	30	III.	9.3	11.3	Breech	Induct. of Labour	Re- covered	Alive	6 $\frac{1}{2}$ lbs.	2 High forceps, both dead born. Induction at 39 weeks. Breech changed to vertex.
E. T.	24	I.	—	—	Vertex	Cæsarean Section	Re- covered	Alive	7 $\frac{5}{8}$ lbs.	—
M. E.	36	III.	9.3	9.6	Vertex	Cæsarean Section	Re- covered	Alive	8 $\frac{7}{8}$ lbs.	1 Embryotomy.
E. F.	24	II.	8.3	9.0	Vertex	Cæsarean Section	Re- covered	Alive	6 $\frac{7}{8}$ lbs.	1 Cæsarean section. Nægele Pelvis.
M. M'C.	38	III.	8.7	—	Vertex	Spontaneous after Perforation	Re- covered	Dead	6 $\frac{5}{8}$ lbs.	(1) Dead; (2) Spontaneous. Cord Prolapsed.

TABLE No. VI.—*Cæsarean Section.*

Name	Age	Para	Date	Nature of Operation	Indication	When Performed	Result to Mother	Result to Child	Remarks
E. R.	35	VII.	23.11.19	Conservative (Classical)	Hyperemesis	34 weeks pregnant In labour	Died	Dead	<i>Vide</i> Table No. IX. and case I.
M. M.	28	I.	19.12.19	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	—
A.O'M.	30	II.	18. 2.20	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	Membranes ruptured.
J. J.	26	III.	20. 2.20	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	—
M. O'N.	24	I.	22. 3.20	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	—
E. S.	21	I.	20. 4.20	Conservative (Classical)	Contracted Pelvis	Before labour	Recovered	Alive	—
S. F.	28	II.	2. 5.20	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	12 hours in, labour membranes ruptured.
E. M'K.	26	II.	13. 5.20	Conservative (Classical)	Contracted Pelvis	Before labour	Recovered	Alive	—
K. C.	22	II.	3. 6.20	Conservative (Classical)	Contracted Pelvis	Before labour	Recovered	Alive	—
S. S.	29	II.	14. 6.20	Conservative (Classical)	Contracted Pelvis	Before labour	Recovered	Alive	—
M. S.	27	IV	10. 8.20	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	—
E. T.	24	I.	8. 9.20	Conservative (Classical)	Contracted Pelvis	In labour	Recovered	Alive	36 hours in labour.
M. E.	36	III.	13.10.20	Conservative (Classical)	Contracted Pelvis	Before labour	Recovered	Alive	C.V. at operation = 10.3 cms.
E. F.	24	II.	25.10.20	Conservative (Classical)	Contracted Pelvis	Before labour	Recovered	Alive	C.V. at operation = 10 cms.

TABLE No. VII.—*Eclampsia*.

Name	Admitted	Age	Para	Condition on Admission	Urine	No. of Fits			Treatment	Result to Mother	Result to Child	Remarks
						Before Labour	During Labour	After Labour				
M. C.	2.11.19	20	I.	Unconscious	Albumen ++	—	5	1	Routine. Forceps delivery	Recovered	Alive	—
M. K.	11.11.19	19	I.	Unconscious	Albumen +	—	2	—	Routine. Forceps delivery	Recovered	Alive	First fit after 22 hours in labour
M. M'C.	2. 1.20	30	II.	Comatose	Albumen +++	—	11	—	Routine	Recovered	Alive	7 months preg. Puerperal Insanity for 3 days. Baby died 3rd day. Fit 10 mins. after delivery.
A. G.	12. 4.20	27	I.	Conscious	Albumen +	—	—	1	Morphia gr. $\frac{1}{2}$ Purgatives: water	Recovered	Alive	In 2nd stage.
M. M'G.	17. 5.20	23	I.	Unconscious	—	—	2	—	Routine. Forceps	Recovered	Alive	—
M. M.	4. 6.20	34	III.	Unconscious	Albumen ++	—	2	—	Routine	Recovered	Alive	—
E. S.	2. 7.20	19	I.	Unconscious	—	—	8	—	Routine. Forceps	Recovered	Alive	—
M. P.	30. 8.20	33	III.	Unconscious	Albumen +++	4	—	—	Routine. Forceps. Submammary Soda Bicarb.	Recovered	Macerated	Some P.P.H.

TABLE NO. VII.—*Eclampsia*.—*continued*.

Name	Admitted	Age	Para	Condition on Admission	Urine	No. of Fits			Treatment	Result to Mother	Result to Child	Remarks
						Before Labour	During Labour	After Labour				
E. G.	4. 9.20	36	I.	Unconscious	Albumen ++	24	2	—	Routine	Died	Dead	Breech; Manual Removal of Placenta. <i>Vide</i> Table No. IX. and case 3.
K. G.	4. 9.20	24	II.	Unconscious	Albumen +++	—	—	3	Routine	Re-covered	Alive	<i>Vide</i> letterpress.
J. L.	18. 9.20	32	I.	Comatose	Albumen +++	—	18	—	Routine. Sub-mammary Soda Bicarb. Forceps	Died	Dead	<i>Vide</i> Table No. IX. and case 4
K. C.	17. 9.20	40	V.	Conscious	Albumen +++	—	—	1	Purgation. Water	Re-covered	Alive	$\frac{1}{2}$ hour after delivery.
T. W.	18.10.20	36	I.	Semi-conscious	Albumen +++	8	—	—	Morphia. Purgation water. Poultices	Re-covered	Alive	Water diet for 15 days. Urine gradually improved and œdema cleared before discharge. Baby (Premature 33 weeks) died 11th day.

REPORT OF THE ROTUNDA HOSPITAL. 367

TABLE NO. VIII.—*Morbidity, B.M.A. Standard.*

Cases	Nov.	Dec.	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Total
Total . . .	201	176	194	196	162	185	195	196	178	174	177	115	2149
Morbid . . .	17	17	15	13	9	9	13	15	13	11	11	7	150
Percentage . .	8.5	9.6	7.7	6.6	5.5	4.8	6.6	7.6	7.3	6.3	6.2	6.0	6.98
Rotunda . . .	9	10	9	8	6	5	6	9	7	7	7	3	86
Estimate													
Per centage	4.4	5.5	4.6	4.0	3.7	2.7	3.0	4.5	3.9	4.0	3.9	2.6	4

TABLE NO. VIII. A.—*Operative Cases Showing Morbidity.*

Operation	Cases	Morbid	Per-centage	Remarks
Forceps . . .	94	5	5.31	One died after eclampsia.
Manual Removal	28	4	4.2	One died from Pulmonary Embolus and one forceps were tried before admission.
Acc. Hæmorrhage	7	1	4.2	—
Lacerated Perin .	652	1.5	0.23	Three after forceps.
Cæsarean Sect. .	14	3	21.4	One died of pneumonia.
Pubiotomy . . .	3	2	66.6	—
Version . . .	19	3	5.7	One Rupture of Uterus
Embryotomy . .	1	1	100.	One Rupture of Uterus
Breech . . .	82	7	8.53	—

TABLE NO. VIII. B.—*Extra-genital Causes of Morbidity.*

Influenza. . . 15	Burns . . . 1	Tonsillitis . . . 2
Phthisis . . . 2	Pneumonia . . . 2	Pharyngeal Abscess 1
Mastitis . . . 29	Cystitis . . . 2	Diphtheria . . . 1
Constipation . . 7	Venereal Warts . 1	Malaria . . . 1
Crural Phlegmasia 4	Nephritis . . . 1	Cardiac disease 1
Tuberculosis . . 1	Ischiorectal Abs . 1	Eclampsia . . . 2
Bronchitis . . . 2	Pulmonary Emb. 1	Alveolar Abscess . 1
Pyelitis . . . 3	Nervous origin . 3	Total 84

TABLE No. IX.—*Maternal Mortality.*

Name	Age	Para	Admitted	Delivered	Died	Cause of Death	Remarks
K. W.	32	I.	10.11.19	11.11.19	14.11.19	Shock following burns	Patient admitted with severe general burns to, 3rd degree; child dead born; never rallied.
E. R.	35	VII.	22.11.19	23.11.19	26.11.19	Post-operative Pneumonia	Hyperemesis Gravidarum; 34 weeks pregnant. Cæsarean Section. <i>Vide</i> Table VI. and case (1).
S. S.	32	I.	15. 1.20	20. 1.20	20. 1.20	Pregnancy Toxæmia Heart failure under anæsthesia	<i>Vide</i> case (2).
E. K.	28	II.	5. 5.20	5. 5.20	5. 5.20	Pulmonary Embolism	Manual removal of adherent placenta on account of P.P.H.; uterus plugged with gauze. 7 hours later sharp attack of Dyspnœa, died $\frac{1}{2}$ hour later.
E. M.	36	III.	3. 6.20	5. 6.20	5. 7.20	Mitral Disease. Failure of Compensation	Premature birth, 28 weeks, 10th day of puerperium marked œdema of legs and general cardiac dropsy. Heart showed double mitral and tricuspid, also enlarged. Dyspnœa marked from beginning. Never morbid.
E. G.	36	I.	3. 9.20	4. 9.20	5. 9.20	Eclampsia Laryngeal obstruction	Admitted in eclampsia. Routine treatment. <i>Vide</i> Table VII. and case (3).
J. L.	32	I.	18. 9.20	18. 9.20	20. 9.20	Eclampsia. Laryngeal obstruction	Admitted comatose. Routine treatment. <i>Vide</i> Table VII., and case (4).

GYNÆCOLOGICAL REPORT.

Nature and Number of Operations and Cases not operated upon.

Total Admissions	549	Tubes and Ovaries—	
Cases operated on	431	Ovariectomy	15
Laparotomies	170	Resection of Ovary	51
Mortality	6	Partial Resection of	
Percentage	1.39	Tube	9
Cases not operated on	118	Salpingectomy 1 tube	11
		„ 2 tubes	15
Vulva and Perinæum—		Salpingo-oophorectomy	3
Bartholin's Cyst	1	„ with other operation	
Perineorrhaphy complete	7	„ „ Single	14
„ incomplete	40	„ „ Double	3
Traumatic Hæmatoma	1	Both Tubes one Ovary	
Ischio-rectal Abscess	1	removed	18
Urethra—		Salpingostomy	13
Caruncle	1	Tube distal portion	
Advancement	1	implanted	1
Prolapse	1	Tubal Pregnancy	8
Repair	1	Parovarian Cyst	8
Vagina—		Parametritis Abscess	2
Recto-vaginal Fistula	1	Miscellaneous—	
Vesico-vaginal Fistula	5	Manual removal of	
Rectum—		Placenta	2
Hæmorrhoids	1	Appendicectomy	3
Cervix—		Herniotomy Ventral	4
Trachelorrhaphy	17	„ Inguinal	2
Amputation	19	„ Femoral	1
Posterior Division	23	Laparotomy T.B. Peri-	
Dilatation only	4	tonitis	2
Uterus—		Mastitis	2
Curettage simple	120	Nephrotomy	1
„ with other operation	51	Abdominal scar Abscess	1
Polypus	3	Cases not operated on—	
Gilliam's Suspension	63	No treatment indicated	27
Ventral „	23	Refused treatment	20
Vaginal „	7	Pregnancy	11
Interposition for		Operation contra-	
Cystocele	8	indicated	1
Radical Cure of Pro-		Cystitis	5
lapse	14	Pessary treatment	
Alexander-Adams	1	Retroversion	15
Double Uterus	1	Vaginitis	2
Myomectomy		Inoperable Carcinoma	
Abdominal	12	Uterus	5
„ Vaginal	4	„ Stomach	1
Hysterectomy		„ Rectum	1
Abdominal	37	Phlegmasia Alba Dolens	1
„ for Fibroids	18	Acute Salpingitis	3
„ „ Fibrosis	13	Constipation	1
„ Wertheim's	4	Spleeno-medullary	
„ Vaginal	6	Leucæmia	1
„ for Fibrosis	3	Mobile Kidney	1
„ „ Prolapse	3	T.B. Peritonitis	2
Fixation of Cervical		Hernia Inguinal	1
Stump to Abdominal		Kraurosis Vulvæ	1
Wall for Prolapse	1	Double Uterus and	
Laparotomy Inoperable		Vagina	1
Carcinoma	3	Septicæmia Puerperal	4
		Syphilitic Ulceration	2
		Vulvitis Gonorrhœal	1
		Gastric Ulcer	1
		Debility	10

EXTERN DEPARTMENT.

Nature and Number of Cases Treated. 1919-1920.

Total deliveries	1,951	Operations— <i>continued.</i>	
Presentations—		Forceps	51
Vertex	1,675	Perforation	2
Face	3	Perineal Suture	190
Breech	58	Version	20
Transverse	14	Eclampsia	2
Twins	44	Mania	2
Triplets	1	Maternal Mortality	7
Abortions, etc.	186	Infantile Mortality—	
Hydatidiform Mole	1	Recent	69
Hæmorrhages—		Macerated	16
Unavoidable	8	Fœtal Abnormalities—	
Accidental	2	Anencephalus	4
Post-partum	17	Hydrocephalus	1
Operations—		Meningocele	2
Manual Removal of		Spina-Bifida	5
Placenta	27	Ectopia Vesicæ	1
Embryotomy	2		

No.	Age	Date of Operation	Died	Cause of Death	Remarks
20,219	43	18.11.19	19.11.19	Shock or Hæmorrhage	Wertheim's Hysterectomy; difficult owing to infiltration of tissue and involvement of Glands.
20,387	26	10. 3.20	13. 3.20	Pneumonia	Cyst in Broad Ligament removed, also Left tube and Right ovary.
20,412	51	23. 3.20	9. 8.20	Cancer of Rectum	At laparotomy tumour found pushing uterus forward and adherent to it; Rectum anterior to swelling and spread out over it; Swelling firm and adherent to floor of Pelvis and giving off a process of hard tissue in direction of R. lateral Pelvic wall. Considered inoperable. Patient became more and more cachectic.
20,558	30	1. 7.20	7. 7.20	—	Dense adhesions; uterus retroverted; L. tube and ovary thickened, removed; R ovary normal, R. tube patent; Progressed satisfactorily till day she died. No <i>Post-mortem</i> allowed.
20,575	57	13. 7.20	15. 7.20	General Peritonitis	At operation deemed inoperable owing to dense adhesions in pelvis, in separating one of these intestine perforated. Perforation closure difficult owing to infiltration of tissue. At <i>Post-mortem</i> the mass, size of a foetal head found to be a Malignant Dermoid of L. ovary infiltrating the walls of the Sigmoid, Rectum, and uterus. A perforation of intestine was present at the site of operation.
20,723	24	7.10.20	8.10.20	General Peritonitis	Double tubo-ovarian abscess removed and abdomen drained. At <i>Post-mortem</i> a small faecal fistula was found in the anterior Rectal wall at the bottom of Douglas' Pouch.

TABLE No. III.—*Unavoidable Hæmorrhage.*

Name	Age	Para	Variety	Period	Initial Pre-sentation	Result to Mother	Result to Child	Delivery in	Treatment and Remarks
M. S.	39	VIII.	Lateral	6½ months	Breech	Recovery	Dead	6 hours	Membranes ruptured and foot brought down; Submammary Saline.
M. H.	36	II.	Marginal	Term	Breech	Recovery	Dead	2 hours.	Os 4 fingers. Membranes ruptured and foot brought down.
A. R.	29	III.	Central	Term	Vertex	Recovery	Alive	4 hours	Hæmorrhage 14 days. Os 2 fingers. Bi-polar version. P.P.H.
B. M.	30	III.	Lateral	8 months	Vertex	Recovery	Dead	1 hour	Os 2½ fingers. Bi-polar version. Cord prolapsed.
L. B.	31	III.	Lateral	Term	Vertex	Recovery	Alive	3½ hours	Os 2 fingers. Bi-polar version.
L. M.	37	III	Marginal	Term	Vertex	Recovery	Dead	2½ hours	Hæmorrhage 1 month. Admitted plugged. Internal version.
L. R. K. W.	24 30	III. II.	Marginal Marginal	Term Term	Vertex Vertex	Recovery Recovery	Alive Dead	5 hours —	Bi-polar version. Os 2 fingers. Bi-polar version.
C. R.	35	I.	Lateral	9 months	Vertex	Recovery	Alive	—	Slight hæmorrhage for 5 days. Os 1 finger.
A. T. J. W.	40 42	X. VI.	Lateral Central	Term Term	Vertex Vertex	Recovery Recovery	Alive Alive	— 3 hours	Hæmorrhage slight. Plugged on admission. Os 2 fingers. Bi-polar version. P.P.H.
T. McC.	34	IV.	Marginal	Term	Vertex	Recovery	Alive	2 hours	Os 2½ fingers. Bi-polar version.
C. M.	40	XII.	Marginal	Term	Vertex	Recovery	Alive	½ hour	Hæmorrhage slight. Os 3 fingers.
E. D.	31	V.	Marginal	Term	Vertex	Recovery	Dead	4 hours	Os 2 fingers. Bi-polar version. Cord prolapsed.

TABLE No. IV.—*Accidental Hæmorrhage.*

Name	Age	Para	Variety	Period	Result to Mother	Result to Child	Presenta- tion	Treatment and Remarks
K. M.	37	XV.	External	8 months	Recovery	Alive	Vertex	Membranes ruptured. Bleeding slight. Delivery 5 days later.
M. H.	40	XV.	External	8 months	Recovery	Alive	Vertex	Contractions infrequent. Quinine intramuscular. Forceps. Submammary Saline, Pituitrin, etc.
A. S.	33	VII.	External	Term	Recovery	Alive	Vertex	Bleeding freely on admission; Os 2 fingers; vagina plugged; 9 hours later plugs removed as in strong labour. No further hæmorrhage.
I. M.	19	II.	External	8 months	Recovery	Macerated	Vertex	Membranes ruptured. Moderate hæmorrhage for two hours. In labour.
C. K.	24	I.	External	9 months	Recovery	Alive	Vertex	Membranes ruptured. Hæmorrhage for one hour. In labour.
M. B.	26	V.	External	Term	Recovery	Alive	Vertex	Membranes ruptured. Hæmorrhage for 4 hours. In labour. Delivered 20 hours.
H. E.	42	IX.	Mixed	8 months	Recovery	Dead	Vertex	Membranes ruptured. Hæmorrhage for 8 hours. In labour. Large amount of clot in uterus.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

The National University of Ireland. War List. Roll of Honour. Dublin: Alex. Thom and Co. 1919. 8vo. Pp. 42.

THOUGH this book bears on the title page the date 1919, it has only recently come to hand. We extend to it a hearty welcome, and congratulate the University on the long Roll of past and present students who have won honour in the war. We regret that more information is not given of those, unfortunately many, who were killed in action or died on active service, but we fully realise the difficulty of doing this in many cases and of the serious objections to which omissions are open. As was to be expected, those named in the list are in most instances medical men, and we are proud to think how worthily they have maintained the traditions of their profession.

Human Parasitology, with Notes on Bacteriology, Mycology, Laboratory Diagnosis, Hæmatology and Serology By D. RIVAS, B.S. Biol., M.S., M.D., Ph.D. Pp. 715. Pub.: W. B. Saunders Co.

THIS work is large, well bound, printed on good paper, and copiously supplied with illustrations—at least half of which are borrowed from other authors, especially from Brumpt. The author claims that his work is a suitable text-book for students and physicians. One would expect such a work to be accurate, free from important omissions and up-to-date. This is not the case. *Entamoeba coli* is said to be easily cultivated artificially, whereas such an eminent authority on the subject as Dobell states that it has never been cultivated. The body louse is “said to transmit typhus;” one would have thought that the experimental evidence was sufficient to satisfy the most critical. *Glossina palpalis* is said to transmit *trypanosoma brucei*; it does not. For the treatment of malaria hypodermic injection of quinine is recommended; this would certainly produce severe sloughing.

Emetine is not mentioned in the treatment of amœbic dysentery, whereas the treatment of malaria is fully discussed. The expression that in a Widal reaction the typhoid bacilli are "precipitated" is not a happy one. The diagram entitled "Method of making a blood film preparation" is misleading. The chapter on hæmatology discusses the Wassermann reaction at length, but no mention is made of such an important subject as the typing of blood. The method suggested for doing blood-cultures would almost certainly result in contamination. A platinum or gold needle is suggested for lumbar puncture; this would be somewhat expensive. The classification of bacteria is chaotic, "a bacillus which is slightly longer than wide is a bacterium," "a bacillus which is distinctly longer than wide is a bacillus."

When a man does some original work on a subject he is justified in writing a book to record his observations and conclusions; if a man can produce a clearer, more concise, and more up-to-date text-book on a subject than any previously published, he is also justified in doing so; otherwise new books merely swell the volume of superfluous literature which is already so great at the present time. To escape this criticism Rivas' work—which has several good points—requires to be thoroughly revised and corrected.

V. M. S.

General Practice and X-Ray. By A. VANCE KNOX and R.

KNOX. A. and C. Black, Ltd. 1921. Pp. xiv. + 214.

THE object of this book is to give the general practitioner a knowledge of the sphere of usefulness of *x*-rays in diagnosis and treatment. Valuable information is further given concerning the preparation of the patient for the radiologist. The necessity of the practitioner giving the *x*-ray specialist the same clinical evidence as he would give any other specialist is emphasised. The book is not intended to give the reader sufficient instruction in technique to use the rays himself.

Part I., by Alice Vance Knox, contains chapters on the sphere of usefulness of *x*-rays, on the diagnosis of disease and injury, on *x*-ray examination of children, and on treatment by *x*-rays.

In Part II. Robert Knox deals with the method of production of x -rays, with the history of their discovery, and the development of radiography.

Besides diagrams in the text over thirty radiograms are reproduced.

Few practitioners will read this book without deriving much useful information. It can also be recommended as a short text-book for students.

A. B. C.

We regret through a printer's error the word "disowns" instead of "disarms" appeared in the second last line of our review of Sir John Bland Sutton's "Selected Lectures and Essays," in our July issue.—Ed., D. J. of M. Sc.

ABSTRACTS OF CURRENT LITERATURE.

MEDICINE.

GRAHAM, G.: *The Source of the Uric Acid Excreted in the Urine after Atophan*. "Quarterly Journal of Medicine," Vol. 14, No. 53. October, 1920. Page 10.

USING recent methods for the estimation of uric acid in the blood and urine of one patient, Graham concludes that the extra uric acid excreted in the urine after atophan administration cannot come solely from the blood, but that there is evidence to show that the passage of undeposited uric acid from the tissues into the urine *via* the blood stream is facilitated. He believes that atophan, sodium salicylate, aspirin or sodium benzoate should be given to gouty people 2 or 3 days of each week.

HENRY F. MOORE.

SYMONDS, C. P.: *Encephalitis Lethargica*. "Quarterly Journal of Medicine." April, 1921.

SYMONDS gives a critical review of present-day knowledge of encephalitis lethargica. Economo gave the name "encephalitis lethargica" to an epidemic disease which appeared in Vienna in 1917, characterised by general intoxication, bilateral ophthalmoplegia, and excessive drowsiness. A similar disease called "nona" had occurred in Italy in 1890. Encephalitis lethargica appeared in England and France in 1918, and in North America in 1919. There is no evidence to show how the disease is spread. Pathologically the lesions are widely disseminated. There is no part of the nervous system or the meninges which may not be affected, but the lesions are most commonly found in the midbrain and basal ganglia. There is congestion with perivascular infiltration, and degeneration of nerve cells and neurones.

The following views have been held as to the ætiology of the condition:—

- (1) It is botulism. This has been disproved.
- (2) It is a form of acute anterior poliomyelitis in which the higher centres are attacked. This view is now untenable.
- (3) It is a nervous complication of influenza. The evidence here is slight, and while the causal organism of either disease remains unproved, their identity also must remain in doubt. Pfeiffer's bacillus has never been found in the brain in encephalitis lethargica, but then many authorities do not accept Pfeiffer's bacillus as the cause of influenza.
- (4) It is a distinct disease in itself. Loewe and Strauss claim to have grown in pure culture on Noguchi's medium an organism

resembling that discovered by Flexner in acute poliomyelitis, but evidence sufficient to establish it as the true cause of encephalitis lethargica has not yet been brought forward.

The cerebrospinal fluid shows a moderate increase in the number of cells in most cases, but is otherwise normal.

The symptoms of the disease are very variable. In a typical case they are as follows:—(1) Toxic symptoms: fever, shivering, pains, malaise, vomiting, furred tongue, constipation, etc. (2) Nervous symptoms: lethargy, ophthalmoplegia, involuntary movements (choreiform, Parkinsonian, etc.), nystagmus, mental changes, etc. The habit of dividing the disease into different types according to the symptom-complex is to be condemned.

The course of encephalitis lethargica is very variable. The mortality is somewhat below 20 per cent. A high temperature is a bad sign. If the patient survives for 3 weeks he will probably recover. Prognosis as to ultimate duration and complete recovery is uncertain.

Diagnosis except in typical cases is difficult. In many cases other conditions are wrongly diagnosed as encephalitis lethargica.

V. M. SYNGE.

CHEINISSE, L.: *Accidents due to certain series of 914*. "Presse Médicale." May 14, 1921.

CHEINISSE records a number of cases in which patients in different parts of France suffered from severe symptoms after the injection of 914. Many of these cases had previously received equally large doses of 914 without any untoward result. On investigation it was found that in all cases where severe symptoms resulted the patients had received 914 of the series E1828. The contents of the ampoules appeared quite normal, and the routine tests performed on rabbits, at the laboratory where the 914 was manufactured, had not shown any unusual toxicity for the animals. It has been suggested that the toxic properties of such samples of 914 are due to the presence of arsenious oxide as an impurity, but the estimation of arsenious oxide, by titration with iodine, is inapplicable here as the iodine also reacts with 914.

Cheinisse suggests that in all cases the number of the series to which any sample of 914 belongs should be carefully noted, and when a new series is commenced, a very small dose should be given to the first patient injected. It would also be better to use horses or dogs instead of rabbits when testing the toxicity of each series of 914 before it is issued, as these animals demonstrate the toxicity of the product more accurately than rabbits.

V. M. SYNGE.

DE LA RIVIÈRE: *Traitement des porteurs de germes diphtériques par l'air chaud*. "Bulletin de l'Académie de Médecine." LXXXV. No. 18. 3 Mai, 1921.

THE author describes in this paper a method of treating healthy carriers of diphtheria bacilli, which he claims to be very successful.

His procedure is to direct a current of hot air from an electric apparatus on to the mucous membrane of the pharynx, in the region of the tonsils. The air is heated to as high a temperature as the patient can bear without discomfort. When the patient feels the temperature to be excessive, the apparatus is withdrawn for half a minute and the current is again applied. Treatment is given once or twice a day, the duration of each session being from 10 to 15 minutes.

De la Rivière claims that the majority of carriers become free from bacilli after from 3 to 5 treatments. In one case, that of a carrier for 10 months, 15 treatments were necessary to render him bacillus free. J.W.B.

BLOOMFIELD, A.: *Variations in the bacterial flora of the upper air passages during the course of common colds.* "Bulletin of the Johns Hopkins Hospital." April, 1921.

THE author compares the aërobic bacteria of the naso-pharynx and tonsils of persons suffering from common colds with those found in normal persons, and fails to find any variation in the flora which would enable one to select any organism, or group of organisms, as the cause of colds. He believes that the primary cause may be the filterable anaërobe of Foster. It certainly is not one of the usual pathogenic types which are responsible for the various complications commonly occurring during the course of a cold. "The primary cold, whatever its final cause, alters the mucous membrane in such a way as to allow secondary bacterial invasion and consequent frequent development of local complications." J.W.B.

CHEINISSE, L.: *L'auto-sérothérapie et l'auto hématothérapie dans les dermatoses.* "Presse Médicale." 30 April, 1921.

SEN, D. N.: *Auto-hemic or auto-serum therapy.* "Indian Medical Gazette." March, 1921.

CHEINISSE gives a brief review of the literature dealing with these new lines of treatment. Of the two chief methods, the first is to inject intravenously the separated and heated serum of the patient, and the second is to inject the whole blood either subcutaneously or intramuscularly. In either case the treatment may be given two or three times a week. Cheinisse confesses that the rationale of the treatment is obscure, but suggests that the serum or blood may act as a foreign protein and produce shock, similar to that caused by the injection of a solution of peptone. He gives an account of several cases which were rapidly cured by this treatment, particularly two cases of obstinate prurigo. The treatment is also claimed to have been very efficacious in such diverse conditions as gangrenous soft sore and prostatitis.

Sen claims that this method of treatment is based "on scientific

principles, and is similar to auto-vaccine therapy." He uses either separated serum or blood, the cells of which have been hæmolysed by the addition of water. The injections are given either intravenously or subcutaneously. Cases successfully treated include "brachial neuritis" with paralysis and atrophy of the muscles of the arm, gonorrhœa, eczema and asthma. J.W.B.

MAXCY, K. F.: *Giardia (Lambli) Intestinalis*. "Bulletin of the Johns Hopkins Hospital." May, 1921.

MAXCY gives the results of the examination of the stools of 89 children who were in hospital, but who were not suffering from any gastro-intestinal disturbance.

In 18 protozoa were found, and in 14 of these the organism was *Giardia*, either alone or accompanied by some other parasite. *B. coli* were present in 5. No protozoa were found in the stools of the 15 children who were aged less than 12 months. 17 per cent. of those aged from 1 to 5 years harboured *Giardia*, and 40 per cent. of those from 6 to 12 years.

The passage of the protozoa was intermittent. In one case cysts were found on February 24, none on February 27, 29, and March 4. On March 6 and 11 large numbers were found.

The author states that the percentage of infestations appears to be much higher in childhood than in adult life, but that *Giardia* is rarely found before the first year. In certain rare instances the parasite may be responsible for some intestinal disturbance, although this point has not yet been firmly established. J.W.B.

TRANSACTIONS.

ROYAL ACADEMY OF MEDICINE IN IRELAND. OBSTETRICAL SECTION.

A meeting was held on Friday, May 27th, the President (DR. E. HASTINGS TWEEDY) in the chair.

DR. R. J. ROWLETTE read a paper entitled, "Note on the Heart in Pregnancy." (See *Dublin Journal of Medical Science*, June, 1921, p. 260.)

The President of the Academy (SIR J. W. MOORE) said that the paper gave a clear and satisfactory classification of heart lesions in pregnancy. He thought that aortic regurgitation was more serious than mitral stenosis, but was much rarer. There were two types of aortic regurgitation—the ordinary valvular kind, and another type found frequently in syphilitic affections, where there is arterial dilatation above the valves. He agreed with Dr. Rowlette that mitral stenosis is always a dangerous affection.

DR. BETHEL SOLOMONS said he considered that the question of heart disease and pregnancy was as important for the obstetrician as for the physician. It was most difficult to decide in a given case when labour should be induced, and each one must be treated on its merits. He had encountered two cases recently. The first developed mitral stenosis after her baby was born, and was treated by a physician, abstinence from pregnancy was advised—this advice was not taken, and in consultation when the patient was three months pregnant, it was decided to induce abortion owing to the precarious state of her health. Two years later, although still suffering from cardiac disease which had improved with treatment, she again became pregnant, and premature labour developed at 8 months. The patient was recommended not to nurse the child.

The other case was more serious; the patient had absolutely uncompensated mitral stenosis; she had had two stillborn babies, and was bedridden during the pregnancy. At 8 months labour commenced spontaneously; there was general anasarca, the vulvæ being enormous. Cæsarean Section was performed to save the life of the child.

DR. KIRKPATRICK said that the great difficulty was to determine how the heart will react when it is diseased. It reacted in different ways in different patients. There seemed to be something as yet undiscovered in cardiac muscle, which would compensate for a trivial lesion but not for a larger one, and the prognosis depended greatly on this. He regarded interstitial pericarditis as a very serious lesion and which was extremely difficult to diagnose. His experience was that when failing compensation occurred in such cases, the patients did badly, as the cardiac hypertrophy which would otherwise occur was limited by adhesions.

DR. ABRAHAMSON thought that cardiac disease in pregnancy

might be regarded from different points of view. There was always a risk of compensatory failure in back pressure, and this was especially so in pregnancy. Some patients with trivial lesions might develop irregular rhythm, and he asked if pregnancy predisposed to abnormal rhythm? The amount of hypertrophy was very difficult to determine, and the most reliable method of doing so was by means of the electro-cardiograph.

THE PRESIDENT said that in the case of patients with heart lesions, the obstetrician could only advise on the subject of child-bearing and the advice was often ignored. Personally, he would advise such patients not to marry. The question was not so much whether a patient would survive a confinement as whether she would live to rear children. In his opinion the latter was the important consideration.

DR. ROWLETTE, in reply, said that the main object of the paper was a protest against the dogmatic teaching of some text-books that a woman with heart disease might not marry. From considerable clinical experience he saw few morbid results from heart lesions in pregnancy.

The Master of the Rotunda (DR. GIBBON FITZGIBBON) presented the Rotunda Report for 1919-1920. (See *Dublin Journal of Medical Science*, August, 1921, p. 337).

DR. BETHEL SOLOMONS thought it a pity that the Master had not seen fit to continue with the standard of morbidity which was in force during the Mastership of Dr. Tweedy, as it was a better method of estimation than that of the B.M.A. It was interesting to note that with the large percentage of morbid cases during the year, there were no deaths from sepsis. He asked if Cæsarean section, under local anæsthesia, had been tried, as some cases of severe toxæmia were suitable for this technique. Was the lateral or crossbed position now in vogue at the Rotunda when forceps were applied? It was a relief to find that excellent results were obtained by palliative measures in the treatment of placenta prævia, and that the popular and unnecessary Cæsarean section for this condition had not obtained favour.

With regard to gynæcology, he asked if silk or catgut were used for suspending the uterus in Gilliam's operation, as he (Dr. Solomons) always used silk, because of the number of relapses he had seen when catgut was the material employed. Posterior division had been done in 23 cases; he was sorry to see this as it was a most frequent cause of incurable sterility.

DR. D. G. MADILL congratulated the Master on the excellence of his first report, which he thought was quite up to the high standard of its predecessors. He thought the complete freedom from morbidity in the cases of placenta prævia was remarkable, but he did not agree with the Master as to the advisability of manually removing the membranes from the uterine wall in such

cases. The risk of sepsis was too great. He was very glad to see that the cases of pubiotomy were allowed to do without the belt from the fourth day; this was very important from the point of view of obtaining fibrous instead of bony union. The two cases of syphilis treated with N.A.B. were very successful, and he hoped the Master would persevere with this treatment, as much information could be obtained from a series of cases.

DR. L. CASSIDY asked at what time the douches were given in septic cases. The lining of the puerperal uterus was smooth, and on section a leucocytic wall could be seen. In streptococcic infection the bacteria had passed into the muscular wall in a few hours, therefore, he asked what effect douching could have? He thought it must be merely mechanical. He asked the reason for the absence of saline infusion in the treatment of eclampsia. He regarded it as very valuable, and he was strongly in favour of venesection. In the cases of pre-eclamptic toxæmia, he asked if there had been any chemical examination of the urine, or any estimation of the blood-pressure?

The PRESIDENT referred to what the Master of the Rotunda called the "eliminative treatment" of eclampsia. That term was not strictly accurate. Elimination meant ridding the blood of toxins, and in the case of eclampsia, these were tox-albumins, which required to be broken up. They could only be removed by venesection. No sweating, purgation, or diuresis could do it. Purgatives could remove toxins which might, if left, injure the woman. Referring to the estimation of morbidity, he asked why the Rotunda method was not followed instead of the B.M.A. method? The former was much the better, and more reliance should be placed on it. In the Report, the B.M.A. method showed a lower morbidity in forceps cases than in normal cases, and a similar thing was seen in cases of manual removal of the placenta. This proved that the method of estimation was wrong. He would have liked to see some special subject dealt with in the Report, such as the action of pituitary extract, or the cause of *post-partum* hæmorrhage. How many, if any, of the latter cases were atonic? He himself was not a great believer in atonic hæmorrhage. With reference to douching, he thought that should only be done if the membranes were retained. In private practice he would not douch for slight elevations of temperature, as it involved an unnecessary risk. In his (the President's) opinion, there was no comparison between plugging and operation in the treatment of uterine rupture. The former was much the better method. Shock in these cases was not the result of bleeding, but is due to the absorption—even to a very small extent—of poisoning blood from the peritoneal cavity, and the best way to remove this was to insert a considerable plug, not merely a strip of gauze.

DR. FITZGIBBON replied.

OBITUARY.

HOYSTED, ISAAC. Died May 3, 1921. Born Co. Kildare, June 20, 1832. Educated at Steevens' Hospital, Dublin, and King's College, London; L.R.C.S.I., 1855; L.R.C.P.I., 1864; F.R.C.S.I., 1865; served as Militia Surgeon, 1855-1856 and 1857-1858; appointed Assistant Surgeon, Army, 1858; Staff Surgeon, 1862; Surgeon-Major, 1873; retired Hon. Brigade Surgeon, June 20, 1887; served in Mutiny and was Extra A.D.C. to Sir Henry Havelock at the Relief of Lucknow; served in Burma, 1885-1887. Died at Sidcup, Kent.

JACKSON, ROBERT WILLIAM. Died May 12, 1921. Born at Edenderry, King's Co., August 11, 1827. Educated at the Royal College of Surgeons, Ireland; L.R.C.S.I., 1851; L.R.C.P.I., 1859; F.R.C.S.I., 1862; Assistant Surgeon 90th Foot, May 26, 1854; Staff Surgeon, October 7, 1859; Surgeon-Major, August 7, 1866; Brigade Surgeon, May 5, 1881; retired Deputy Surgeon-General, Dec. 16, 1882; service in the Crimea, Mutiny, Ashanti, 1873-74; South Africa, 1880; Egypt, 1882; created C.B. (Military), 1874; Medjide (3rd Class), 1882; Knight, 1882. Died in Dublin.

KIDD, ANTHONY. Died April 22, 1921. Born 1859. Educated at the Ledwich School, Dublin; L.R.C.S.I., 1879; L.R.C.P.I., 1880; Surgeon R.N., 1881; Staff Surgeon, 1893; Fleet Surgeon, 1897; retired, 1914; employed at the Bath War Hospital; Anæsthetist to the Bath Ear, Nose and Throat Hospital.

KIRWAN, ALBERT. Died April 9, 1921. Born October 26, 1841. Educated in Dublin; L.R.C.S.I., 1867; L.R.C.P.I., 1868; F.R.C.S., Ed., 1889; D.P.H., R.C.P. & S., Eng., 1889; Assistant Surgeon, Army, March 31, 1868; Surgeon-Major, March 31, 1881; Surgeon Lt.-Col., March 31, 1888; retired, October 26, 1896. Died at Hampstead.

MOYNAN, RICHARD MICHAEL. Died April 23, 1921. Educated at Queen's College, Galway, and the Ledwich School, Dublin; M.D., M.Ch., R.U.I., 1882; Medical Officer of Cowbridge District, Glamorganshire. Died of septic pneumonia.

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Original Communications.

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RIFLE BULLET IN HEART.

By MAURICE R. J. HAYES, F.R.C.S.I., Radiologist, Mater
Misericordiæ Hospital, Dublin.

OUR knowledge of the physiology of the heart being derived almost exclusively from experimental research on animal organs, the opportunity rarely offers of observing in the human heart some of the phenomena which can be seen only in the physiological laboratory. The case which I am about to record seems, therefore, worthy of note not only because it supports a particular theory in regard to the movements of the heart during systole and diastole, but also because the case itself is unique.

In December, 1916, Pte. G., aged 22, was referred to me by Colonel Sir William Taylor for the accurate localisation of a bullet which was thought to be embedded in the region of the heart. He was wounded in Mesopotamia in 1916. The entrance wound, which had quite healed, was in the left axilla. Nothing particular could be elicited from the patient in regard to his condition at the time of injury. There were apparently no special symptoms referable to his heart, and there was nothing worthy of note in respect of his condition when I saw him.

Assisted by Dr. E. J. Watson and Dr. H. Mason, I localised the missile by the usual Mackenzie-Davidson method, first from the front, and then from the back of the chest, and reported as follows:—

“ The bullet is situate at a distance of 5.5 centimetres from the skin on the anterior chest wall, and 11 centimetres from the skin on the dorsal aspect of the chest. In our



Fig. 1.

Anterior view of chest showing shadow of bullet.

opinion it is located in the diaphragmatic wall of the left ventricle, and midway between the heart apex and the base of the ventricle (the auriculo-ventricular groove).

“ On examination with the ‘ screen ’ the shadow of the bullet was observed to move *outward* toward the apex of the heart during ventricular systole, and it moved *inward* toward the base of the heart during diastole.

“ The leftward movement during ventricular systole is caused by contraction of the ventricular fibres of the heart muscle which draw the auriculo-ventricular junction toward the apex.

“ The rightward movement during auricular systole (which immediately precedes ventricular systole) is caused by the drawing backwards of the auriculo-ventricular junction, by the *musculi pectinati* of the auricle, to the *crista terminalis*, which also acts as a fixed base for these muscles.

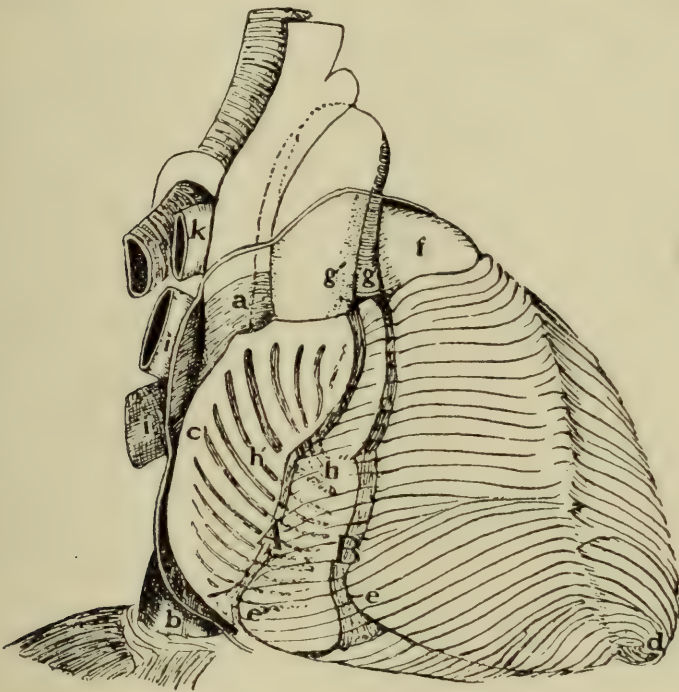


Fig. 2.

To show the antagonistic action of the musculatures of the right auricle and ventricle (Keith). A, the position of the A-V groove at the end of the auricular systole; B, its position at the end of ventricular systole.

(From "Further Advances in Physiology," 1909.)

“ This peculiar movement of the bullet is an additional proof that it is embedded in the wall of the ventricle.”

In order to make this “ to-and-fro ” movement of the heart more clear, I will quote from “ Further Advances in Physiology,” edited by Leonard Hill, 1909, pp. 67 and 68:—

“ In the human heart they (the *musculi pectinati*) are fifteen to eighteen in number, and from 1 to 2 mm. in

diameter. They take origin from the right linea terminalis, and end in the musculature of the auricular canal in the A-V groove. The linea terminalis is a fixed point through the venous mesocardium; therefore when the muscoli pectinati contract, they are drawn towards the fulcrum, the ventricle being also drawn up at the same time. It will therefore be seen that this movement which empties the auricle at the same time draws the ventricle over its load. There is therefore in auricular systole a movement of the A-V groove towards the venous base of the heart. This function of the muscoli pectinati has been well demonstrated by injecting warm wax into the auricle, the casts so obtained showing that the muscoli pectinati shorten to quite half their diastolic length during systole (Keith). In hearts from cases of back pressure there is great prolongation and hypertrophy of these muscles. Now an anatomical axiom is that every muscle in the body has its opponent, the opponent in this case being part of the inner longitudinal layer of muscle of the right ventricle. Inspection of the ventricle will show two layers of muscle—an inner longitudinal and an outer spiral layer. The longitudinal layer can be divided into two systems—(1) That to the auricle or venous base; (2) that to the aortic exit or arterial base. The significance of the system to the arterial base is perhaps at first not quite apparent. According to Keith, its function is to act with the spiral fibres in rendering the apex a fixed point. The spiral fibres will tend by their contraction to lengthen out the ventricle; the longitudinal layer from the arterial base will tend by their contraction to shorten it. Between them, therefore, they render the apex a fixed point. The apex thus being fixed, the force of their combined contraction is to empty the ventricle of its contents. The significance of the longitudinal layer of trabeculæ to the auricle is quite clear. This layer is the opponent of the muscoli pectinati of the auricle. The apex being a fixed point, its contraction in ventricular systole draws down the A-V groove towards the apex. By the action, therefore, of these opponent sets of muscles in the auricle and in the ventricle, the well-known to-and-fro movement of the heart at the A-V groove is executed.” (See A, B, Fig. 2.)

MOBILE ASCENDING COLON AND DUODENAL OBSTRUCTION AS COM- MON CAUSES OF EQUIVOCAL SYMPTOMS IN THE ABDOMEN.

PRELIMINARY REPORT.*

By ADAMS A. McCONNELL.

THERE are some abdominal cases in which the symptoms seem to justify a diagnosis, definite perhaps, but operation proves it wrong, and there are many in which the symptoms point to no particular lesion. The patients of the latter type often become the subjects of an exploratory laparotomy in the course of which a lesion may be found or the appendix removed. Sometimes the appendix richly deserved it and the patient is cured, sometimes the symptoms persist or return.

During a period of six months twenty-one cases have been referred to us with the following range of diagnosis or description:—acute appendicitis 2, chronic appendicitis 3, gall-stones 2, intussusception 1, acute intestinal obstruction 1, gastric ulcer 4, renal pain and frequency of micturition 4, renal pain 1, multiple arthritis 1, chronic constipation 2.

The *one* lesion common to *all* these patients was an abnormally mobile ascending colon.

That this was the direct or indirect cause of their symptoms is proved by the relief afforded by limiting its mobility

ANATOMICAL EFFECTS OF A MOBILE ASCENDING COLON.

A consideration of the anatomy of this portion of the bowel indicates how such equivocal symptoms may be produced.

In embryonic life the ascending colon has a mesentery. This normally disappears so that the gut lies in direct contact with the posterior abdominal wall and is fixed in posi-

* From the Richmond Hospital, Dublin.

tion by the reflection of the parietal peritoneum. The hepatic flexure and the beginning of the transverse colon become similarly fixed to the anterior surface of the right kidney and to the second stage of the duodenum respectively. (Fig. 1.)

By means of this fixation the ascending colon is maintained in a vertical position as a practically straight tube presenting some slight curves or flexures. In a certain number of cases the ascending colon retains its primitive mesentery and misses its fixation. It tends therefore to sink downwards to the limit permitted by its mesentery. Now if anything prevents the cæcum from descending, the hepatic flexure approximates to the cæcum, and the ascending colon as a whole collapses like a concertina, and looks as if it had been "pushed into a space which is too short to

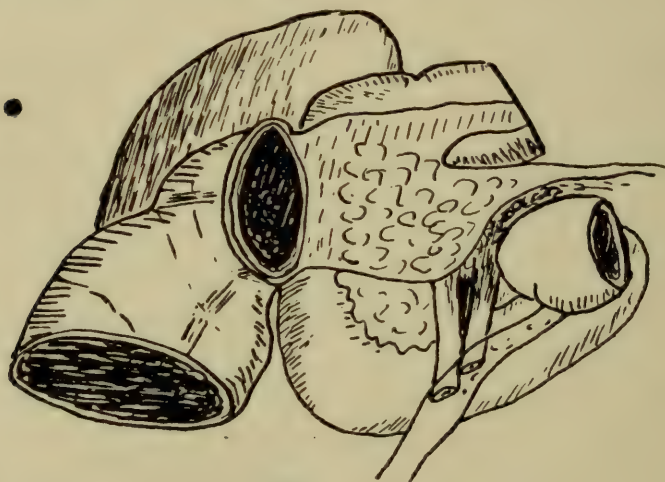


Fig. 1.

accommodate it" (Cunningham's Anatomy). Hence it becomes a tortuous tube instead of a straight tube, and peristalsis has to drive the colonic contents not only up-hill as normally, but also against the resistance imposed by the kink or kinks in the tube and by the dead weight of the upper segment of the ascending colon. The obstruction to peristalsis produces distension of the cæcum. If the contents of the ascending colon were fluid such obstruction might not matter very much, but they are not fluid, they are semi-solid, and consequently more readily impeded. Normal tonicity of the musculature of the abdominal wall will not

prevent this concertina-like collapse of the ascending colon. It can keep the ascending colon up, but it will not necessarily keep it straight. When the muscles of the abdominal wall have lost their tone and are lax, the cæcum sinks freely into the pelvis, and there is not the same tendency to kinking of the ascending colon, but the weight of this segment of gut is now borne by its persisting mesentery which is attached



Fig. 2.

above to the right kidney and the second stage of the duodenum.

Close apposition of the hepatic flexure to the kidney is one of the factors which retain that organ in its normal position; when, therefore, the ascending colon is mobile what should be a support becomes a dependant, and the right kidney tends to sink in the abdomen. As it sinks, kinking of the ureter may occur at its junction with the pelvis and hydronephrosis ensue.

The strain exerted by the colon on the second stage of the duodenum gradually draws the latter forwards and downwards and radiates to the first stage of the duodenum and the pyloric end of the stomach. As the common bile duct enters the second stage of the duodenum it also is subject to strain, which in turn may produce a kink of the cystic duct.

Moreover, the ascending colon derives its blood-supply



Fig. 3.

from the superior mesenteric artery. When the colon is mobile and prolapsed there is a certain degree of tension on the trunk of this artery through its ileo-colic and right colic branches. In other words, the superior mesenteric artery is drawn taut above the origin of these branches, that is, exactly where it crosses the third stage of the duodenum (*see* Fig. 1). This part of the duodenum is constricted

between the rigid vertebral column behind and the superior mesenteric artery drawn like a string in front. This constriction produces dilatation of the duodenum proximal to it. In some of these cases we have observed such a dilatation of the duodenum associated with mobility of the second stage, so that the duodenum from its pyloric end to the superior mesenteric artery seemed to rotate forwards like a bucket-handle, and was the *first* thing to present in the abdominal wound. The dilatation is due to obstruction by the artery,



Fig. 4.

the mobility to the direct pull of the prolapsed hepatic flexure on the second stage.

Obstruction of the third stage of the duodenum by the superior mesenteric artery has been recognised since 1849, when Rokitanski described it as a possible cause of acute dilatation of the stomach. Albrecht, in 1899, described two cases of chronic duodenal obstruction as possibly due to this cause. Since that time an immense volume of literature has grown round the subject under the term chronic gastro-mesenteric ileus. In 1907 Bloodgood drew attention to the

association of chronic obstruction of the duodenum by the artery, and mobility of the ascending colon. The latest paper on the subject is by Kellogg.

Waugh, who gives an excellent account of the other effects produced by the mobile ascending colon, does not mention duodenal obstruction at all. In this series of twenty cases it has been noted in four.

Glénard, in his classical researches on enteroptosis, mentioned that mobility of the hepatic flexure was associated with duodenal obstruction.

Some of our cases have had a well-marked parieto-colic or Jackson's membrane, but the colon still possessed a certain degree of mobility. In these cases division of the membrane revealed the primitive mesentery. Portions of this membrane were sometimes thickened into definite bands which caused constriction of the gut, often excessive and always accompanied by marked distension of the cæcum.

Nature having neglected to fix the colon during that period of peritoneal flux when fixation was easy seeks to do it later by joining the gut to the parietal peritoneum by membrane. Nature's colopexy is often efficient, but sometimes she does too much and sometimes too little.

The greatest single factor maintaining the abdominal organs in position is the tension of the abdominal muscles. When these muscles lose their tone, after pregnancy or other cause, displacement of viscera downwards is likely to occur. It is to this loss of muscular tone that the late onset of symptoms in some of these cases is ascribed. General enteroptosis was not present in any of these patients.

RELATION OF SYMPTOMS TO ANATOMICAL EFFECTS.

The symptoms in this series of cases can be divided into groups corresponding to the anatomical findings:—

Group I.—Symptoms due directly to the mobile ascending colon and usually referred to the right iliac fossa.

Group II.—Symptoms due to the ascending colon affecting other organs.

Group III.—Symptoms due to duodenal obstruction by the superior mesenteric artery (chronic gastro-mesenteric ileus).

Group IV.—Symptoms due to stasis in the mobile ascending colon.

To these four groups might be added another in which the symptoms were not due to the mobile colon which was present.

Group I.—*Symptoms Due Directly to the Ascending Colon.*

A sensation of discomfort or fullness in the right iliac fossa due to distension of the cæcum. This may develop into severe colicky pain as the gut makes spasmodic efforts to empty itself, or may become a “feeling as if the inside was falling down,” accompanied by nausea and dry eructations. This latter sensation often comes on during or immediately after breakfast. In the morning the ascending colon is loaded, food excites peristalsis, which, failing to overcome the partial obstruction in the prolapsed bowel, causes a more or less acute distension of the cæcum. If such a patient is kept in bed for breakfast the factor of gravity is removed and the peristalsis stimulated by the meal empties the ascending colon before the patient assumes the erect posture. Many patients have found this out for themselves. As time goes on this matutinal discomfort may be repeated after every meal, or it may be practically eliminated by a dose of salts and breakfast in bed.

Case I. Female aged 30. Six months before all kinds of food began to disagree with her giving immediate discomfort in the right iliac fossa, in short time definite acute pain started in this region after food. She felt sick after each meal *especially* in the morning, when after a few mouthfuls she felt so sick that she could not take any more. In the course of an hour or two she could resume her interrupted breakfast. When she stayed in bed she could take food freely without pain. Never vomited. Constipated. Tenderness right iliac fossa.

X-ray. Very mobile ascending colon. Excursion of hepatic flexure four inches (see figs. 3 and 4). Rest of gastro-intestinal tract normal. Stasis in ascending colon. Operation. Colopexy and appendicectomy. Result, complete relief of pain, return of appetite. Still somewhat constipated.

Case II. Female 25. For three years sense of "sinking" in abdomen, nausea and dry retching immediately after food, especially breakfast, *absent when breakfast in bed*. Severe pain in back on exertion. Marked constipation. Had severe grade of anæmia from age of 18 till 22. Still anæmic. X-ray. Gastropstosis. Mobile ascending colon. Treated by gastric lavage for month, no relief, then abdominal massage and dose of salts every morning. Great improvement. Symptoms return when over-tired or when she gets up for breakfast.

Case III. Male 47. For two years attacks of severe pain on exertion in right lumbar and iliac regions. Flatulence. Constipation. X-ray. Mobile ascending colon. Operation. Colopexy. Result complete relief of pain, somewhat constipated still.

Distension of the cæcum is so common a phenomenon that many physicians ignore it, but its significance must be appreciated. The normal cæcum is *not* distended.

Severe acute pain and superficial tenderness in the lumbar region with a swelling in the right iliac fossa have occurred in those cases in which a Jackson's membrane has been found constricting part of the colon. The tenderness corresponded to the parietal attachment of the membrane. When the distended colon dragged the membrane the acute pain of peritoneal irritation was added to the more chronic discomfort of distension.

Case IV. Female 54. Acute pain right iliac fossa and right lumbar region. Nausea. Superficial tenderness in lumbar region and rigidity over painful areas. Swelling right iliac fossa. Dry tongue. Temp. 99. Pulse 92. Diagnosis, acute appendicitis. Operation. Appendix normal. Ascending colon very mobile except where one portion of a Jackson's membrane formed a band constricting it. The attachment of this band to the parietal peritoneum corresponded to the point of maximum tenderness. Membrane removed. Colopexy. Complete relief.

Case V. Female 58. Abdominal discomfort after meals two years. Pain and fullness right iliac fossa. X-ray, mobile colon. Operation. Colopexy. Complete relief.

Group II.—Symptoms Due to Ascending Colon Affecting Other Organs.

(a) *Gall-bladder*.—Sudden onset of intense pain in the right hypochondrium characteristic of biliary colic. Tenderness is present over the gall-bladder and after the attack the gall-bladder is palpable. One case, in which jaundice was present and the urine contained bile, showed free mobi-

lity of the duodenum which may account for obstruction of the common duct. In other cases kinking of the cystic duct is the probable immediate cause of the symptoms.

Case VI. Female 60. For 15 months intermittent attacks of extreme pain in region of gall-bladder. Jaundice began after third attack of pain and reappeared after each succeeding paroxysm. Nausea during attacks. No relation to food. Tenderness over gall-bladder. Urine contained bile.

X-ray. Small gastric residue $7\frac{1}{2}$ hours after meal. Stasis in proximal colon. Ascending colon very mobile. Excursion of hepatic flexure 5 inches. Operation. Gall-bladder and biliary ducts normal, no stones. Duodenum very mobile. Colopexy. Complete relief.

(b) *Kidney*.—Acute pain in the right lumbar region simulating renal colic occurs when the kidney sinks, and kinking takes place at the uretero-pelvic junction. The phenomena of Dietl's crisis did not occur in this series. Pain of a dull aching type in the lumbar region was present in two cases, and was associated with intermittent attacks of frequent micturition. We have demonstrated that a definite anatomical hydronephrosis was present in two cases. Sodium bromide 20 per cent. was injected into the ureter of the affected side and an *x*-ray of the pelvis obtained (Fig. 2). The plate shows dilatation of the pelvis of the ureter ending abruptly at the uretero-pelvic junction. It is important to note that slight degrees of hydronephrosis, though producing definite symptoms, cannot be demonstrated when the kidney is exposed. The greater part of the pelvis is in the renal sinus. Pyelography is the only method of demonstrating hydronephrosis at an early stage. In other words, if the diagnosis is not made before operation it will not be made at operation. There is no such thing as intermittent hydronephrosis; the symptoms are intermittent, but the hydronephrosis is not.

Fig. 3 shows the ascending colon of the patient whose pyelogram is shown. The *x*-ray was taken in the recumbent position. The change in position of the colon consequent to the patient assuming the erect posture is marked by Fig. 4.

Case VII. Male 49. Weakness on exertion. Pain right lumbar region sometimes acute. Occasional stabbing pain left hypochondrium when walking. Says he feels a lump in right side when pain is bad.

Physical examination negative except for movable right kidney. Urine normal. Pyelogram, hydronephrosis (Figs. 2, 3, and 4). Barium meal. Very mobile ascending colon. Operation. Colopexy. Complete relief.

Case VIII. Female 25. Three years before acute pain right iliac fossa and frequent micturition. For last year dull ache right lumbar region with intermittent frequency. Ache worse in damp weather and on exertion. Physical examination negative except for mobile kidney. Repeated diagnosis of hysteria. Pyelogram, slight hydronephrosis. X-ray. Extremely mobile ascending colon, could be pushed across middle line. Marked stasis. Cystoscopy. Bladder could not be distended because of loaded colon, the presence of which in the pelvis invaginated the vesical wall. Operation advised. In meantime abdominal belt and liquid paraffin.

(c) *Bladder*.—Discomfort or pain in the right iliac fossa bearing a direct relation to micturition was the outstanding feature in two cases. In one the onset of pain corresponded to an empty bladder and in the other to a full one. In the former case the full bladder seemed to support the loaded colon and take the strain off its mesentery; in the latter most of the ascending colon was lodged in the pelvis in front of the retroverted uterus, so that when the bladder became full it exerted pressure on the colon. The characteristic feature of this pain in relation to micturition was that it was felt in the right iliac fossa and not along the urethra, thus is it distinguished from the pain of renal or vesical origin. Bulging of the bladder wall by the loaded cæcum may sometimes be seen with the cystoscope, as in case VIII. This bulging disappears when the patient is put in Trendelenburg's position.

Case IX. Female 30. Sense of fullness in right iliac fossa for six weeks. Pain in right iliac fossa coming on at night, worse in morning. Always increased at end of micturition. Diagnosis. Mobile colon producing movable kidney. Operation. Very mobile kidney and ascending colon, most of latter in the true pelvis. Colopexy. Complete relief.

Case X. Aching pain right iliac region when bladder full, disappeared at end of micturition. Increased by exercise. Frequency of micturition and nocturnal incontinence. Congenital backward displacement of uterus. X-ray. Very mobile ascending colon in pelvis. Operation. Suspension of uterus. Colopexy. Complete relief.

*Group III.—Symptoms Due to Obstruction of the Duodenum
by the Superior Mesenteric Artery. Chronic
Gastro-Mesenteric Ileus.*

Pain across the epigastrium and extending on both sides into the hypochondria. Sometimes the pain is felt intensely in the back at the same or higher level. In one case it was only felt over the gall-bladder region.

The pain had a remarkable and unexpected relation to posture in that the erect posture relieved it while the recumbent made it worse. Some of these patients volunteered the information that when the pain came on they would stand up, bend forward and press upwards with a hand on each side of the umbilicus. One said that the pain went away when she sat on the chamber. Possibly when supine the mesenteric artery was drawn more taut over the duodenum, while pressure may have forced the duodenal contents through the obstruction. In one case deep palpation in the epigastrium produced marked gurgling. In but one case had pain any definite relation to food.

Tenderness to the right side of the epigastrium was constant, and was present to the left side in addition in one case. X-ray examination localised the maximum tenderness over the duodenum.

Case XI. Female 12. Admitted as intussusception. Three days before acute pain across upper part abdomen. Vomited once copiously. Stools contained blood and mucus. Attacks of pain intermittent since onset, relieved when sat on chamber. Physical examination negative except for tenderness right side of epigastrium. Operation. Dilatation of duodenum down to crossing of superior mesenteric artery. Freely mobile ascending colon loaded with hard fæces. As colopexy would have required another incision it was not done. X-ray few days after showed retention of barium in duodenum. Treatment directed to unloading colon. When this was done complete relief. If constipation avoided there will probably be no drag on artery.

Case XII. Male 28. Six years before violent pain right hypochondrium after food. Frequent vomiting. Several similar attacks at intervals of months since. Tenderness right hypochondrium. X-ray suggested duodenal ulcer. Mobile ascending colon. Operation marked dilatation of duodenum down to crossing of superior mesenteric artery. Colopexy. Complete relief.

Case XIII. Male 50. For five months pain in epigastrium, more severe towards left side, no relation to food, increased when recumbent, diminished when erect. Obstinate constipation. Had

lost weight since onset. Tenderness over duodenum on deep palpation. Pressure at umbilicus elicited gurgling. X-ray. Stomach dilated and drawn over to right side. Suggests duodenal irritation or adhesions to duodenum. Some mobility of ascending colon. Operation. Definite dilatation of duodenum as far as crossing of superior mesenteric artery. When mesentery of small intestine was raised, duodenal dilatation diminished and gurgling of contents was noted. Ascending colon could not be drawn to mid-line incision. Dilatation of duodenum not considered sufficient to warrant duodeno-jejunostomy, and colopexy would have required another incision. Treatment. Abdominal belt and liquid paraffin relieved symptoms.

Case XIV. Female 32. Suddenly got acute pain right and left sides of epigastrium and across the back at same level. No relation to food. Relieved by *extending* the legs and by pressure. Tenderness right hypochondrium. No constipation. Vomited eight hours after onset. Pain lasted as dull ache with acute exacerbations for fourteen days. X-ray. Mobile ascending colon. Rest of gastrointestinal tract normal. Operation. Dilatation of duodenum to superior mesenteric artery. Very mobile and prolapsed ascending colon. Colopexy. Complete relief.

The next three cases are placed in this group because of their clinical resemblance to those just described. The symptoms were probably due to duodenal obstruction, but the radiographic and operative evidence is not complete. One of them illustrates the fact that the diagnosis of "appendix dyspepsia" can only be substantiated by the removal of a *diseased* appendix. Another was a disappointing result after gastro-enterostomy performed eight years previously, and suggests the possibility of duodenal obstruction as a concomitant of gastric ulcer. The *whole* duodenum should be examined when gastric or duodenal ulcers are found at operation, and especially when they are *not* found at an operation designed to treat them. After gastro-enterostomy any duodenal obstruction persists, and bile regurgitating into the stomach promotes vomiting.*

Case XV. Male 37. For two years pain in epigastrium, relieved by pressure. Flatulence, eructations and constipation. Diagnosis of appendix dyspepsia and normal appendix removed by the writer. Stomach normal. Ascending colon very mobile. A year later re-admitted with same symptoms. Operation contraindicated by

* Cases of definite gastric and duodenal ulceration associated with mobility of the ascending colon or duodenal obstruction will be recorded in a future communication.

chronic bronchitis. Abdominal belt and liquid paraffin afforded some relief.

Case XVI. Female 47. Eight years previously gastro-enterostomy. Pain relieved completely, but frequent attacks of bilious vomiting ever since. Constipated. X-ray. Gastro-enterostomy opening functioning well. Very mobile ascending colon with stasis. Operation. Adhesions masked second stage duodenum, third stage not inspected. Colopexy. Complete relief. No vomiting since (six months).

Case XVII. Male 50. Intense pain in epigastrium a few hours before admission. Tenderness only on deep pressure right hypochondrium. Constipated for some days previously. Looked well, no vomiting. Pain relieved by pressure and by bending forward. X-ray. Mobile ascending colon. Treatment. Liquid paraffin. Complete relief.

Group IV.—Symptoms Due to Stasis in the Mobile Ascending Colon.

Symptoms of chronic intestinal stasis are many or few according to whether one adopts the views of Sir Arbuthnot Lane or not. The cause of constipation lies frequently in mobility of the ascending colon. A daily movement of the bowels is no proof that a patient is not constipated, and Seton Pringle has emphasised the significance of two or three evacuations a day in cases of organic obstruction. The anæmia in case II. was in all probability due to constipation from this cause, as it continued well marked until the constipation was overcome. The complete and spectacular relief of arthritis in the following case furnishes a clue to treatment, medical or surgical.

Case XVIII. Female 32. Chronic arthritis both ankles, both wrists and right metatarso-phalangeal joint. Onset eighteen months previously. Periarticular swelling and tenderness pain on movement. Unable to walk. X-ray showed blurring of articular outlines and some erosion of cartilages. General examination was negative. The bowels moved every day without purgatives, and she said she had never been constipated. All defective teeth had been extracted previously in the hope of removing foci of infection. Exhaustive examinations of the nose and nasal sinuses failed to show any septic focus. There was marked anæmia. Patient had been under medical treatment for a year, and was under observation and treatment general and local, in hospital for two months, without the slightest improvement. X-ray of gastro-intestinal tract showed very mobile ascending colon still loaded after 48 hours, though the bowels had moved twice. Operation. Colopexy. Inside three weeks all the

periarticular swelling had disappeared and the patient could move joints and walk freely.

Case XIX. Male 30. Extreme constipation dating from operation for hæmorrhoids four years previously. No other symptoms. Rectum and anal canal normal. X-ray. Very mobile colon, loaded after 72 hours. Operation. Colopexy. Thin Jackson's membrane present.

Case XX. Male 22. Similar history to that of Case XIX. X-ray. Ascending colon prolapsed but not mobile, still loaded after 52 hours. Operation. Well developed Jackson's membrane division of which revealed primitive mesentery. Colopexy. The immediate result in these two cases was good but they have been done too recently to warrant any conclusions.

One case in which the ascending colon was very mobile, but was not fixed at the operation, must be added, as the symptoms were not due to its mobility. The duodenum was not inspected.

Case XXI. Female 27. Indigestion seven years. For three weeks before admission pain left hypochondrium and epigastrium after meals, relieved by vomiting. Obstinate constipation. X-ray. Marked stasis in ileum. Mobile ascending colon. Operation. Removal of Lane's Kink. Appendicectomy. Complete relief.

The immediate relief afforded in these cases by limiting the mobility and correcting the prolapse of the ascending colon leaves no doubt that the symptoms, diverse as they are, are due directly or indirectly to that mobility.

DIAGNOSIS.

Once suspected the diagnosis can be made absolute by radioscopic examination. *X-rays* have given us second sight, and we are wilfully blind to the interests of our patients if we neglect to use them. Diagnosis must precede treatment. Examination with the fluorescent screen determines two essential points:—(1) The excursion of the hepatic flexure as the patient passes from the erect to the recumbent position.

(2) The degree of lateral mobility. We have frequently pushed the ascending colon across the middle line by abdominal palpation under the screen.

Dilatation of the duodenum and retention therein requires special technique, and Dr. Hardman has demonstrated these points in two of the cases.

TREATMENT.

To limit mobility and diminish weight are the aims of treatment.

Medical treatment should be tried in every case. Massage of the abdominal muscles, an abdominal belt, a dose of salts every morning, a prolonged course of liquid paraffin. These methods may relieve the symptoms as a truss relieves a hernia.

Surgical treatment offers the only cure. Most abdominal operations counter one abnormality with another. Colopexy substitutes a normal for an abnormal condition.

If duodenal dilatation is marked and is not attributable to a mobile ascending colon, duodeno-jejunostomy is indicated.

An appreciation of the significance of this congenital defect will avoid many a diagnosis of hysteria, and will rescue many from invalidism. There will be fewer negative laparotomies, and typical operations such as gastro-enterostomy, appendicectomy and nephropexy, will not yield so many disappointing results.

The continual co-operation of Dr. T. Garrett-Hardman, who did all the *x-ray* work in connection with these cases, made this communication possible. My thanks are also due to my resident pupils for their careful and intelligent case-records.

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A CASE OF ACUTE MENINGITIS.

By W. A. WINTER and W. M. CROFTON.

THE patient, aged 27 years, was admitted to hospital on December 6th, 1920, complaining of violent headache and pain and stiffness in neck. His family history was unimportant. He stated that he had always been a healthy man, and was on war service for three years and seven months. He contracted malaria in Salonika in 1916, also dysentery the same year, and was wounded in the thigh during his service in France. There was no history of venereal disease. He was a well-developed man, prematurely bald and looked somewhat older than his years. He stated that he fell the day before his admission to hospital and struck his head on the ground. There was no evidence of any external injury on admission. His temperature was 100 degrees and pulse 84 regular. He lay curled up in bed with his head retracted and neck rigid; his complaint of pain in the head was constant, and it appeared to be extremely severe. His tongue was very foul, and some dried blood was seen at the alæ nasi. There was some blood-stained crust in the nostrils. Nothing abnormal was found in the chest, abdomen or heart, nor was there any discharge from the ears. Herpes was present on the lips. On examining his nervous system it was noted that his pupils were dilated, and the patient complained of photophobia. Superficial reflexes were present. The knee jerks were sluggish; ankle clonus was not elicited. There was a doubtful Babinski on the right side, the left response being normal. Kernig's sign was present. Movements of joints and eyes were normal except for stiffness in neck. There was no paralysis. No albumen or sugar was present in the urine.

Headache was the dominant complaint all through the illness. At times its severity seemed to be almost unbearable, and the patient's expressions of pain were so superlative that we at first thought they were due to his not bearing pain well, but we were later convinced that this was not so. Nothing seemed to give relief to this symptom at

first, but spinal puncture appeared to alleviate it in some degree after the first ten days of his illness.

Throughout the illness his temperature was very irregular and moderate in degree; only on three occasions did it reach 101 degrees. The pulse varied from 60 per minute to 110, and the pulse rate rather increased after the first lumbar puncture was done on December 9th, when about 20 c.c.'s of turbid fluid under considerable tension was withdrawn. The presence of pus cells in this fluid and of a gram-negative bacillus was reported. Lumbar puncture was again done on December 13th, and the former observations confirmed. On this occasion the withdrawal of the cerebro-spinal fluid appeared to relieve the headache, and it was again repeated with similar result.

The patient was quite conscious throughout his illness and quite coherent. When coming towards the stage of convalescence he complained that he was deaf in one ear. Mr. Mathews kindly examined this for me, and reported a very small perforation with no discharge visible. As regards treatment, the symptom that called for relief in the early stages was headache. Various remedies were tried, but without avail until we gave half-grain doses of morphia hypodermically. A vaccine was prepared from the micro-organism found in the cerebro-spinal fluid. The first dose of $2\frac{1}{2}$ millions was given on December 15th, and it was continued in increasing doses until March 2nd, when he had 50 millions. Patient's temperature did not finally become normal until December 31st, but ten days before that, after his second dose of vaccine, his headache was so much less violent that we were able to stop his morphia, and on January 7th, one month after admission, it was noted that the headache had practically gone, and the patient was convalescent and able to be up on January 15th. When last seen some time in March about three weeks after he left hospital he was still deaf.

The bacillus was about the size of the *B. coli*, showing long forms. It was non-motile, gram-negative, and did not liquefy gelatin, and it produced acid, but no gas in glucose, lactose, mannite and saccharose.

On blood agar it formed a grey opaque colonies attaining a diameter of 5-6 mm. in 48 hours.

The fact that it was isolated on two occasions and the marked retrogression of symptoms following each dose of antigen leave no doubt in our minds that it was the causative organism.

We suggest as a probability that the middle ear was the source of infection, the bacillus getting into the meninges through a lesion in the tegmen tympani produced by the violence he suffered 36 hours before admission.

Gram-negative bacilli of various kinds, many of which cannot be put into any category, are quite common in infections of the middle ear. The perforation of the drum is very suggestive in this connection.

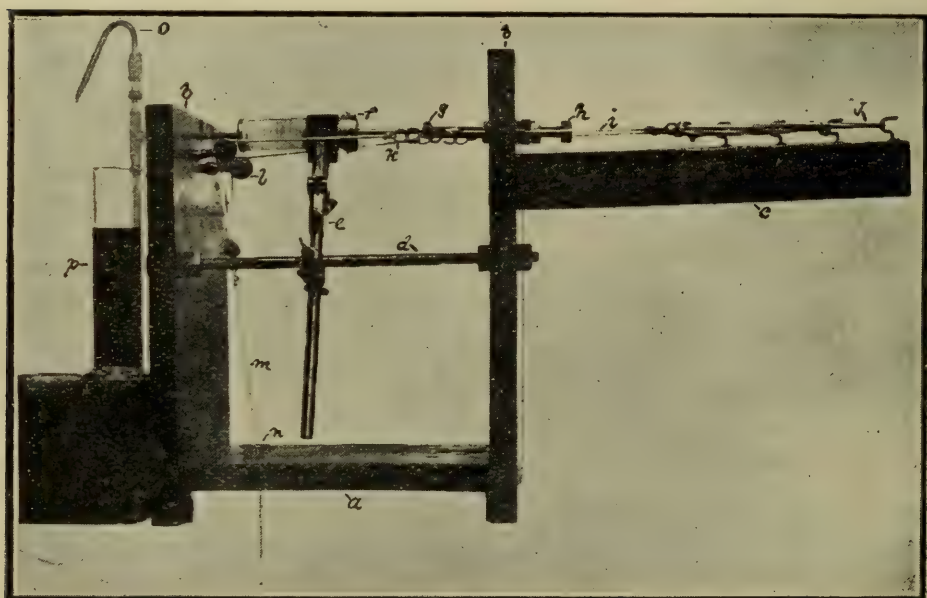
AN AUTOMATIC FLUID DISTRIBUTOR.

By JOSEPH W. BIGGER, M.D., D.P.H.

LABORATORY workers frequently require to measure equal volumes of fluid into a number of tubes or vessels. Where the volume is small this is usually done with a graduated pipette, but, if the number of tubes to be filled is large, this process becomes tedious and liable to error. In order to obviate these disadvantages various kinds of apparatus have been devised. One of the simplest of these, Cole's distributor (1) has several drawbacks—it is not very accurate; it requires the use of one hand to actuate it; and the fluid to be measured is taken into a rubber bulb, the interior of which is difficult to clean. Vernes has lately devised an apparatus, to which he has given the name "aspiropipeur" (2). He uses it for measuring small volumes of fluid in performing his modification of the Wassermann reaction. The apparatus here described was suggested by Vernes' instrument, but it is simpler to make and more convenient than its prototype.

The details can be made out fairly well from the photograph. The distributor consists of a wooden base board, *a*, to which are attached two firm uprights, *b* and *b*. From the back of one of these runs an extension, *c*. The uprights are strengthened by an iron bar, *d*, the ends of which are threaded for the nuts which hold it in place. The clamp, *e*, which is adjustable in any position on the bar *d*, holds a Record syringe, *f*. The round finger-end of the piston rod of the syringe has been replaced by a bar, *g*, which screws on to the rod in its place. Pairs of cords, *k* and *i*, are attached by hooks to the bar *g*. The pair *k* pass over pulleys *l* and *unit*, and from their union the cord, *m*, passes through a hole, *n*, in the base board. This cord continues through a corresponding hole in the table to a foot treadle on the floor. The cords *i*, pass through holes in the back upright, and their ends are attached to a length of stout elastic, *j*, the tension of which can be regulated by the hook to which it is attached. The nozzle of the syringe is united by a piece of

rubber tubing to the glass-valved tube, *o*, which is exactly the same as that of Cole's apparatus. It is provided with two ground-in glass valves which allow fluid to be drawn up from the vessel *p*, and delivered at the upper end. The tension of the elastic keeps the bar, *g*, tightly pressed against the long screw, *h*. The stroke of the piston (that is, the volume of fluid to be measured) can be regulated exactly by screwing *h* in or out. It is held in position by two lock nuts. The stroke can be altered also by moving the clamp holding the syringe along the bar, *d*, but the screw, *h*, always acts as a fine adjustment.



Having regulated the volume desired the fluid is placed in *p* and the action started. By pressing on the treadle, *m* is pulled down, and therefore the piston is driven home. When the pressure of the foot is released, the elastic withdraws the piston to the desired extent, and thus sucks up the fluid into *o* and also into the syringe. With a few strokes the apparatus is filled and is then ready to distribute the required volume into as many tubes as is desired. It is a great advantage to actuate the apparatus by the foot as both hands are left free for holding the rack containing the tubes which are being filled. The action of the distributor is much more rapid, more accurate and less fatiguing than the use of a graduated pipette. The volume distri-

buted can be altered in a few seconds by the screw, *h*. The distributor is so made that any size of Record syringe from 1 c.cm. to 20 c.cms. may be used. Since the cords are attached to the bar, *g*, by hooks, the substitution of one syringe by another is very quickly accomplished, or a syringe may be removed and used for other purposes. The smaller syringes are used for performing the Wassermann Reaction, and the larger for filling tubes with a constant known volume of saline or fluid culture media.

The distributor is easily and cheaply made, and the only piece of special apparatus required is the tube, *o*.

I am indebted to Dr. E. C. Smith for the accompanying photograph.

References.

1. S. W. Cole, *Practical Physiological Chemistry* 1919.
2. R. Douris et R. Bricq, *Séro-diagnostic de la Syphilis*. (*Bulletin des Sciences Pharmacologiques*, XXV., 1918.)

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

The Endocrines. By S. W. BANDLER. W. B. Saunders Co. 1920. 486 pp.

THE book is written by a gynæcologist who has obviously become an enthusiast in "endocrinology." The greater part of the work deals with gynæcological problems from the standpoint of the rôle of the ductless glands in ætiology and therapy; for example, puberty and climacteric are discussed; there is a chapter on sterility in women, another on pregnancy and labour, and another on dysmenorrhœa. Several interesting chapters are devoted to psycho-pathology in relation to derangement of the endocrine glands. The chapter on heredity and environment is of particular interest from the view-point of the education of children. The book can be recommended to those who are capable of good judgment, but the tyro in medicine may be carried away by the argument into believing that endocrine therapy can cure almost all the ills that flesh is heir to. As yet, we are but at the beginnings of knowledge in matters relating to the ductless glands, and, while keeping a receptive mind, one might well show more caution in accepting as proved the theories that are held by the author.

HENRY F. MOORE

Chemical Pathology. By H. GIDEON WELLS, Ph.D., M.D. 1920. Philadelphia and London: W. B. Saunders. Pp. 695. 4th Edition.

THE recognition of chemistry as one of the chief foundations of medical science, though somewhat tardy, is now almost universally agreed upon. The Fourth Edition of this work embodies recent advances in pathological chemistry. Much new matter has been added on the subject of deficiency diseases and vitamins. The chapters dealing with immunity have been amplified and slightly altered. The book, as in previous editions, is well printed on good paper, but in this

edition more use has been made of small type, to prevent too great an increase in the bulk of the work.

Whether as a book of reference for the physician or as a text-book for the pathologist, this work furnishes an admirable treatment of the subject of chemical pathology—a subject of great and ever-growing importance in the advancement of the scientific knowledge of disease.

V M. S.

The Clinical Examination of Diseases of the Lungs. By E. M. BROCKBANK, M.D., F.R.C.P., and A. RAMSBOTTOM, M.D., F.R.C.P. 1921. London: H. K. Lewis. Pp. 88. Illustrated.

THIS small work is intended to aid students in the clinical examination of cases of disease of the lungs. The book is one of the best of its kind, and its small size and consequent portability adds much to its usefulness. There is, however, room for some improvements—there are not enough diagrams; there is not sufficient explanation of the dependence of signs on physical laws; in places the information is not sufficiently concise, and again in places the treatment of the subject lacks system. On the whole, these faults are small in degree, compared with the value of the book, and the authors are to be congratulated on their work.

V. M. S.

Studies in Deficiency Diseases. By R. McCARRISON, M.D., D.Sc. 1921. London: Henry Frowde and Hodder and Stoughton. Pp. xvi.+270. 82 illustrations. 4to.

OUR knowledge of accessory food factors or vitamins is of very recent date, but already much information of primary importance has been acquired and a new field has been opened up for medical research. McCarrison aims at presenting a consecutive account of the results of recent experimental researches into the nature of deficiency diseases, and at pointing out the application of these results to treatment, both prophylactic and curative.

The work which is well printed, copiously illustrated, and clearly written, consists of four parts:—

(1) Gives a brief summary of present-day knowledge as to the source and properties of the different vitamins.

(2) Deals with the various factors which influence the onset of symptoms and with the symptoms themselves.

(3) Describes the pathological changes resulting from faulty food.

(4) Indicates the practical applications of laboratory results to the prevention and cure of deficiency diseases.

The author's own experiments and the results obtained are fully discussed, and the conclusions arrived at are critically analysed. The work is a valuable contribution to the present all too scanty literature on the subject of vitamins, and should be read by all who desire to keep abreast of the developments of modern medicine.

V. M. S.

Practical Preventive Medicine. By MARK F. BOYD, M.D.
Pp. 352. 135 illustrations. Philadelphia: W. B. Saunders Co. 1920.

WHILE reading the earlier chapters of this book, devoted to the consideration of infectious and transmissible diseases, we almost believed that we had, at last, found the ideal small text-book on preventive medicine. We regret, however, that the succeeding chapters removed this belief. It would almost seem as if the section on epidemiology was planned for a work of about one thousand pages and, when it was completed, the author found that only two hundred pages remained for the rest of the subject. He writes, in the foreword, "A great condensation has been effected which in many instances perhaps results in an inadequate consideration of important subjects," and in this we must agree with him. We cannot agree that the book represents even the minimum knowledge of the subject which a student of medicine or a practitioner of medicine should be expected to possess.

Over one hundred pages are given to infectious diseases and diseases transmitted by insects and from animals. While

we appreciate this part of the book very highly, as it is comprehensive, accurate and modern, we regret the allowance of only six pages to air, heating and ventilation, six to domestic sanitation, twenty to excreta disposal and twenty-five to water, as these are totally insufficient in what purports to be a practical book.

The chapters on hazards and diseases of occupation and that on milk also deserve mention, as in them the subjects are as capably treated as the limits of space allow.

The bacteriological terminology is, in part, new to us, and although we know what is meant by *mycobacterium tuberculosis*, *mycobacterium diphtheriæ* and *bacterium typhosis*, we fail to see the advantage of the new terms over the old.

The illustrations, and particularly some of the diagrams, are very good, and the paper and printing are, as is usual in American text-books, above reproach.

The work is so good in some parts and so disappointing in others that we would like to know if Dr. Boyd proposes to write another and larger book on the same subject. We believe if he did so, a work of seven or eight hundred pages from his pen would be good throughout. His errors, so far as we have been able to find, are of omission, but never of commission.

J. W. B.

Clinical Bacteriology and Hæmatology for Practitioners. By W. D'ESTE EMERY, M.D. Sixth Edition. Pp. xiv.+310. 66 illustrations. London: H. K. Lewis and Co. 1921. 15/- net.

WE regret that the new edition of this well-known work has not been thoroughly revised and brought up to date. We can sympathise with the author in his unwillingness to "replace some of the simple and well-tried methods for some more recent ones," but this is not sufficient to explain the absence of all mention of some modern discoveries in bacteriology which are of very great importance in the treatment of disease.

As examples of such omissions we may say that the existence of different serological types of the meningococcus and

the pneumococcus is not even noted. The fundamental importance of using curative serum prepared from a strain of organisms homologous with that present in the patient's body in pneumonia, and still more in meningitis, ought to be impressed on every student and practitioner.

Perhaps the most important omission is in the section on hæmatology, in which we find no reference to the types of human blood. Transfusion of blood is now such a well-recognised and much-used treatment that we regard the omission of the methods of typing blood, prior to transfusion, as very serious. The technique is so simple and the necessary apparatus so rudimentary that the work could be done by any practitioner.

More examples might be given, but the above are sufficient. In our opinion the space devoted to the Wassermann reaction might well have been more usefully employed in filling up such lacunæ as these.

These criticisms may seem unnecessary and even impertinent in the case of a book which has, for nearly twenty years, been of the greatest use to many practitioners who live in situations remote from laboratory facilities. They are made, however, in the hope that the author, whose work has for the most part been so well done, may be persuaded to revise and modernise this book before the next edition appears.

J. W. B.

School Hygiene and the Laws of Health. By CHARLES PORTER, M.D. Fifth Edition. Pp. xx.+361. 121 illustrations. London: Longmans, Green and Co. 1920. 6/6 net.

THE chief aim of this book is to impart to teachers sufficient knowledge of the anatomy and physiology of the human body to enable them to instruct school children in these subjects.

Since it is intended for teachers and not for scholars, the scope of the work has been extended so as to include information on infectious and other diseases of childhood, medical inspection of school children and the hygiene of schools.

The fact that the present edition is the fifth is clear evi-

dence that the work is appreciated by those for whom it has been designed.

We have found it readable and, for the most part, accurate, although we do not agree with some of the author's statements. For example, he writes that tuberculous affections of the heart are "very common in children."

We can recommend this book to teachers and others interested in the welfare of school children with every confidence that they will benefit by reading it.

J. W. B.

Sanitary Law and Practice. By W. ROBERTSON, M.D., D.P.H., and CHARLES PORTER, M.D., B.L. Fifth Edition. London: The Sanitary Publishing Co., Ltd. 1921. 18/6 net.

THIS work is intended for students of public health, but we believe that it will not be greatly favoured by many of them on account of its size and the very large amount of information which it contains. It will, we think, find most favour with medical officers of health and those who, having obtained their D.P.H., intend to specialise in public health administration. What they regarded as defects in their student days will subsequently appear as virtues.

This is not a text-book of the theory of hygiene, but rather of applied hygiene. It deals fully with the law relating to each subject and then, more briefly, with the practical points arising, and especially the procedure to be adopted in each case.

Although the authors are Scotch, the English law on each branch is first given and then the details on which Scotch and Irish law differ from this are stated. The difficult task of selecting the essentials and ignoring the unessentials in the many acts considered has been very well done. So far as we have tested it we have found the information to be accurate and clearly expressed.

We regard this work as one for reference rather than as one to read, and we are certain that the newly-appointed M.O.H. who keeps it conveniently to hand for ready reference will make few mistakes, and will soon acquire a real knowledge of the intricacies of public health administration.

J. W. B.

A Manual of Public Health. By W. G. AITCHISON ROBERTSON, M.D. Fourth Edition. Pp. ix.+260. 25 illustrations. London: A. and C. Black, Ltd. 1921. 10/6 net.

THIS book was, in previous editions when it was published in one volume with the author's "Medical Jurisprudence," one of the most popular of the many text-books on public health in use among students of medicine. We believe that the present edition will be as widely used and as much appreciated as were the former editions.

The work succeeds in giving the student a clear outline of the most important parts of the subjects, and is better balanced and more readable than many of its rivals.

We think that, if the author had consulted a bacteriologist, certain portions of the book might have been improved and modernised. For example, the use of a vaccine would not have been recommended for the treatment of cerebro-spinal meningitis.

We do not agree with the author who omits any consideration of venereal diseases on the grounds that they have "more an ordinary medical interest than a public health one." The recognition of the danger of these diseases by the State in recent legislation surely places them among the most important from the public health standpoint.

On page 22, where the use of the formula, $\frac{e}{r-R} = x$ in calculating the amount of fresh air required is explained, a small mistake is made. It is said that r and R represent amounts of carbonic acid gas per 1,000 cubic feet of air. They really are the amounts of this gas per cubic foot. The examples of the use of this formula are, however, correctly given. It seems strange that this mistake, which was also present in the second edition (1913), has escaped correction.

J. W. B.

Manual for Health Visitors and Infant Welfare Workers.

By MRS. ENID EVE and OTHERS. London: John Bale, Sons and Danielsson, Ltd. 1921.

A MOST important part of preventive medicine deals with the home conditions of women and children, and these can best

be investigated and improved by the visits of women, who must be specially trained for the work.

This little book is written for health visitors and infant welfare workers and also for those who are thinking of taking up these careers. It gives a clear description of the necessary training and the many and varied duties of a health visitor. Chapters, each written by an expert in the subject, are devoted to maternity and infant welfare centres, infectious diseases, and the tuberculosis visitor.

The whole book is eminently practical, and we have found the information always reliable and to the point. It is very readable and not without humour. We can cordially recommend it to any woman who is fond of children and her fellow-women, and who is seeking for an interesting and useful profession.

J. W. B.

TWO NEW EDITIONS ON FORENSIC MEDICINE.

1. *Medical Jurisprudence and Toxicology*. By JOHN GLAISTER, M.D., D.P.H., Camb., F.R.S.E., Professor of Forensic Medicine and Public Health in the University of Glasgow. Fourth Edition. With 137 illustrations and one coloured plate. Edinburgh: E. and S. Livingstone. 1921. Pp. 902. Price 30/- net.
2. *Manual of Medical Jurisprudence and Toxicology*. By W. G. AITCHISON ROBERTSON, M.D., D.Sc., F.R.C.P.E., Lecturer on Medical Jurisprudence and Public Health, Royal College of Surgeons, Edinburgh. Fourth Edition. With one coloured plate and 26 illustrations. A. and C. Black, Ltd., London. 1921. Pp. 414. Price 12/6 net.

1. THE many high qualities of Prof. Glaister's text-book are well known, as is proved by the fact that this is the Fourth Edition of a comparatively modern book. Perhaps one of its most marked features consists in the wealth of illustrative cases which are mentioned—some of them at considerable length. In this respect it contrasts with our ever-reliable friend, "Dixon-manu." This feature makes it most

valuable as a book of reference, either for medical practitioners or barristers.

This Fourth Edition is larger than the third by about 50 pages. Accounts of many poisons which have recently become important appear for the first time, such as nitro- and di-nitro-benzene and T.N.T., which last is described at considerable length. The important subject of the relationship of inebriety to criminal responsibility is treated in a full and satisfactory manner, and several recent authoritative judgments are quoted in full. In other sections additions are freely made, so as to bring the book quite up to date.

Altogether, we warmly recommend Prof. Glaister's work as a text-book on Forensic Medicine—too full, indeed, for a student's manual, but as being a really first-class book of reference upon its subject.

2. The familiar "Robertson's Jurisprudence and Hygiene," beloved of successive generations of students, has, alas! come to an end. It is now published in two volumes, of which that before us is the first—viz., on Jurisprudence only. That on Hygiene is to follow. These two volumes are full and rather larger than the original single volume was; but with the increase in the number of the volumes, the price has increased in equal ratio.

The book is in our opinion one of the best for students' purposes: sufficiently full, not too diffuse, and generally clear; and we have been in the habit for years past of recommending it to our class. But in some respects it might be improved. The illustrations of *post-mortem* staining on page 60 are so crude as to be useless. *Post-mortem* staining itself is not due to "gravitation of blood into the capillaries and small blood-vessels of the rete mucosum." The rete mucosum is, of course, the deeper layer of the epidermis, and so contains no blood-vessels at all. The distended blood-vessels in *post-mortem* lividity are those of the superficial layer of the cutis. The section on Food Poisoning is not as clear as it should be; apparently no distinction is made between bacterial toxins and ptomaines, and no reference is made to the work of Savage and others, who have

proved that true ptomaine poisoning probably never occurs.

But these and other matters to which we might refer do not materially detract from the value of the book—one of the best of its size in the English language.

Diseases of the Ear, Nose and Throat in Childhood. By DOUGLAS GUTHRIE, M.D., F.R.C.S. A. and C. Black, London. Pp. viii. + 88. 1921.

THIS book is designed to assist the general practitioner, the inspector of schools, the nurse, and the social worker, and to familiarise them with the main facts underlying the modern treatment and prevention of ear trouble. The importance of adenoids in the cause of deafness is placed well before the reader, and stress is placed on the fact that the prevention of deafness rests largely on vigorous and judicious treatment in childhood.

The book is well got up, the text clear, the diagrams simple and sufficient, and it can be recommended as fulfilling the limited and elementary object for which it was designed.

J. S. J.

Six Papers by Lord Lister. With a Short Biography and Explanatory Notes. By SIR RICKMAN J. GODLEE, Bart., K.C.V.O., M.S., Medical Classics Series. Pp. 194. London: John Bale, Sons and Danielsson, Ltd. 1921.

THIS little volume is the first of a series of classics of medicine in course of publication under the general editorship of Dr. Charles Singer. The subjects of other volumes in preparation are Ambroise Parè, Laennec, Anenbruggee, Hippocrates, and Galen on Anatomy. We are glad to think that there is a reading public for such works, for to go back to the classics of medicine gives a solid foundation of knowledge and helps us to judge modern work in true perspective. No better choice of an editor for Lister could have been found than his near kinsman, Sir Rickman Godlee, to whom we are already indebted for the official life of the father of modern surgery. Not the least interesting part of

the present volume is the sketch of Lister's life by his editor. One cannot doubt that much of the orderliness of that great mind, its freedom from prejudice, and his temperament and self-respecting dignity, came from his Quaker blood and upbringing. Sir Rickman Godlee passes rather lightly over the furious opposition offered to Lister's doctrines when first published, and the chilling insolence which afterwards met him from the surgical profession of London when he migrated to King's College in 1877. At that period there was no excuse. Scotland and Ireland had been converted, and in 1876 Lister's tour on the Continent was almost a triumphal progress. But in London prejudice and jealousy held the field, and when Lister began to lecture at King's College, he found the benches empty, for the London student was "cold and uninterested in anyone whose views were unknown or unacceptable at the Royal College of Surgeons." It is, indeed, a sorry tale, and we cannot but think Sir Rickman Godlee too optimistic when he says: "It is like a chapter of ancient history, but it would never need to be written about the reception of any novelty, however grotesque, at the present day." It is, perhaps, a relief to ordinary human nature to learn that even so great and good a man as Lister was not without human prejudices, for it was surely a prejudice which made him hold so strongly to chloroform in preference to ether during his long career as a surgeon. In the selections from his papers given here by Sir Rickman Godlee readers will find good examples of Lister's close thought, his careful observation, and his sagacity.

Materia Medica and Pharmacy. By REGINALD R. BENNETT, B.Sc. (Lond), F.I.C. London: H. K. Lewis and Co., Ltd. Fourth Edition Pp. 264.

An attractive little volume—pocket size—equally suitable for practitioner and student.

The type is divided into compact paragraphs with prominent headings, such as would render memorising pleasant work. A good alphabetical list of definitions is given.

The doses are well tabulated and form a ready reference

—they are also grouped for examination purposes. Some important incompatibles are clearly explained.

That the work has passed through four editions in rapid succession is a further guarantee of its usefulness.

Altogether one of the most concise little volumes we have seen.

E. C. S.

Materia Medica. (Students' Synopsis Series.) By JAMES BURNET, M.A., M.D., Ch.B., M.R.C.P. (Edin.). London: J. and A. Churchill. Pp. 80.

THE author in his preface alludes to *Materia Medica* as a bug-bear—a statement with which most students will agree.

This little handbook should do much to cheer them up. It contains the essentials required for an examination, but no lumber. It is arranged alphabetically, consequently an index is not required. The definitions given are lucid and a list of the essential B.P. preparations is included.

The print is extremely legible—arranged so as to render the matter easy to assimilate. Used in conjunction with some standard work it should prove as useful as a Baedeker.

E. C. S.

The Doctor's Manual. By A. HERBERT HART, M.S. London: John Bale, Sons and Danielsson, Ltd. Fourth Edition. Pp. 256.

A USEFUL little work. The earlier chapters on dispensing are concise and to the point. The author's claim that he has "cut the drug bill" is no catch-phrase.

Proprietary medicines are becoming an important part of the medical man's equipment. The *Manual* gives the more reliable preparations with notes on their relative advantages. Local anæsthetics are dealt with in detail. Antiseptics, spas, vaccines, harmones, oral hygiene—each of these forms the nucleus of a pithy article.

In dealing with cysto-purin, the author states it "causes an increased outflow of lymph to the affected parts, with the consequent exudation and liberation of a proportionately

greater number of lymphocytes which engulf the gonococci." Is it not somewhat unusual to find gonococci in lymphocytes?

That the teeth should be cleaned after every meal—not merely for ten seconds, but for sixty or more—is a sound maxim.

The book concludes with a useful little index of treatment, that of eczema being somewhat scanty—and a synopsis of venereal treatment.

A little volume which the young medical would do well to possess.

E. C. S.

French-English Medical Dictionary. By ALFRED GORDON, A.M., M.D., Paris, late Associate in Nervous and Mental Diseases, Jefferson Medical College, etc. Roy. 8vo, pp. 161 + vi. London: H. K. Lewis and Co.

WITH the utmost knowledge of the French language difficulties must be encountered by those who read the many excellent books, journals and monographs which emanate from France, and the volume under review will supply a long-felt need. It is impossible and unnecessary to examine every word in the Dictionary or to seek for omissions, but there is no doubt that great care has been taken in this arduous compilation. We venture to hope that the author in succeeding editions will consider seriously two improvements: (1) to state the derivations of the words; (2) to give an English-French Dictionary as well. The pronunciation of every term is given in brackets, and this, in addition to its other qualities, makes the publication one of the most useful contributions to medical literature which has appeared for some time.

B. S.

Principles of Biochemistry. By T. BRAILSFORD ROBERTSON. Lea and Fibiger, 1920. Pp. 602.

THE book is written for the use of students intending to specialise in biochemistry in relation to physiology, but it should prove helpful to the physician interested in these subjects. The author thinks that, as a preparation for the

study of biochemistry, some knowledge of organic and physical chemistry as well as a "nodding acquaintance" with higher mathematics are essential; he deems that a "moderate familiarity" with the principles of differential equations and a knowledge of the calculus are useful if not even necessary. A knowledge of the methods of the statistician is most essential. The work is divided into six parts as follows:—(I.) The foods; (II.) the properties of protoplasm; (III.) the chemical correlation of the tissues; (IV.) the chemical processes which underlie and accompany life phenomena; (V.) the products of tissue activity; (VI.) the energy balance of the organism. The work is well up to date, gives much useful information, and can be thoroughly recommended.

HENRY F. MOORE.

Annals of Medical History. Volume III. Number 1. March, 1921. New York City: Paul B. Hoeber. London: Baillière, Tindall and Cox. Pp. 96.

AN interesting number of this American quarterly publication has fallen into our hands. The editor is Francis R. Packard, M.D., of Philadelphia, Pennsylvania. He is assisted in his editorial labours by fourteen associate editors, including many names of cosmopolitan reputation.

The present number includes articles on Leonardo da Vinci as a scientist, Shakespeare (as we prefer to spell the name) and the practice of medicine, the giving of medical degrees in the Middle Ages by other than academic authority, and the scientific life of Thomas Bartolin, the famous Professor of Anatomy in the University of Copenhagen from 1648 to 1680. But the papers which possess most interest for us are an appreciation of Sir William Oder, by Dr. D. A. Webb, and a well-written and sympathetic address delivered to the graduating nurses of the Church Home and Infirmary, Baltimore, Maryland, by Dr. Henry Barton Jacobs, of that city.

In his address the author gives an excellent account of the philanthropic life-work of Elizabeth Fry, the reformer of Newgate Prison; of Theodore Fliedner, founder of the

Deaconess Hospital, Kaiserswerth, on the Rhine, near Düsseldorf; and last but by no means least, of Florence Nightingale, "unquestionably the founder of modern nursing." "Her career," writes Dr. Jacobs, "was a call and a challenge to women. Here was a woman of high ability, rich, and of great social standing, who had forsaken all to become a nurse. Is it any wonder that she had followers?" How many the history of the Great War tells us in narratives of deeds more eloquent far than words?

I. W. M.

The Chemistry of Synthetic Drugs. By PERCY MAY, D.Sc., 3rd Edition, revised. Longmans, Green and Co. 1921.

ALTHOUGH three years have passed since the previous edition appeared, the author has not found it necessary to make any material changes in the 3rd Edition.

The book is not increased in size; the table of contents is unchanged, and the alterations and additions are of a minor character, a few references being made to toxic chemicals employed in the recent war.

We now know that phosgene gas (carbonyl chloride), COCl_2 , is more poisonous to man than prussic acid, and that "mustard gas" (di-chlor-ethyl sulphide) and T.N.T. (trinitrotoluene) are very dangerous substances.

The book is not adapted to the ordinary student, for an adequate knowledge of organic chemistry is requisite in order to follow the text intelligently.

On the other hand, it has considerable value for professors or teachers of materia medica, and also as a reference book for chemists who will be glad to get some discussion of the still obscure relations between chemical constitution and pharmacological action, coupled with brief notices of the therapeutic uses of most of the chief drugs.

The book possesses a good index; it is carefully worked up, and is of real importance.

W. G. S.

ABSTRACTS OF CURRENT LITERATURE.

MEDICINE.

OTO-LARYNGOLOGY.

ST. CLAIR THOMSON: *Intrinsic Cancer of the Larynx; Usual site of Origin, as demonstrated at 50 laryngo-fissures, and its influence on Diagnosis, Prognosis and Treatment.* "British Medical Journal." June 25th, 1921.

THE text-books of Morell Mackenzie (1880), and Lennox Browne (1899) both expressed the view that the ventricular bands were the site of origin in a majority of cases. This was corrected by Semon (1896) who demonstrated that the vocal cord was the part attacked in a very large majority of cases. But Semon followed Virchow's teaching that malignant growths showed a preference for the posterior part of a vocal cord. The author gives the results of 50 cases in which the site of origin was not only viewed in the laryngeal mirror but directly inspected during a laryngo-fissure. The disease was limited to the anterior third of a cord in 3 cases; to the middle third in 7 cases, and in not one single case was it limited to the posterior third. In 16 cases the anterior and middle thirds were invaded; in 3 cases the middle and posterior thirds, and in 21 cases the whole cord was attacked. In addition, he points out that the subglottic region, and its anterior third, was either the original site of disease, or was invaded by extension, in 13 cases.

He arrives at the following conclusions:—

Conclusions as regards usual Site of Origin:—1. Intrinsic cancer of the larynx originates on the vocal cords or in the subglottic area.

2. It has never been found in the posterior commissure (interarytenoid region), nor originating from the ventricular bands or the ventricle of Morgagni, in 50 cases carefully examined both indirectly with the mirror and by direct examination after splitting the larynx.

3. A malignant growth may originate on any part of a cord, but is more common in the central portion or anterior half than in the posterior area of the larynx.

4. As is now well known, an epithelioma originating in this region remains for a long time limited to the cord affected and the adjoining side of the larynx, but it may cross the anterior commissure, and, in later stages, it invades the arytenoid and the area to the outer side of it.

5. The inner surface of the cord may be affected primarily or by extension. The subglottic area may be invaded by a growth originating in a cord. But a cancer may also start below the level of the cords, in the subglottic area.

6. A subglottic cancer is much more common in the anterior than in the posterior half of the larynx.

Conclusions as regards Prognosis:—1. The superficial or projecting tumours of limited extent are the most favourable.

2. Those situated in the middle third or anterior half of the cord are more promising than those invading the anterior commissure in front, or the arytenoid region behind.

3. Growths embedded in a cord, or extending into it below an intact mucosa, are not so favourable.

4. An epithelioma extending along the inner margin of a cord is still less favourable.

5. Subglottic cancers are very unpromising as regards lasting cure by laryngo-fissure. They are frequently associated with impaired mobility or complete fixation of a cord.

Conclusions as regards Operation:—1. In every case, however limited the growth, the entire vocal cord should be excised from the anterior commissure up to and including the vocal process of the arytenoid.

2. The growth, with as wide a margin as possible of apparently healthy tissue all round it, should be removed in one mass; the excision should, therefore, go down to the lower edge of the subglottic area, above it should pass through the healthy ventricular band, and externally it must include the perichondrium lining the thyroid ala.

3. To facilitate this, the thyroid ala should be removed so that a laryngo-fissure is really a partial hemi-laryngectomy.

COLLISON, J. G. : *Acute Purulent Otitis Media in Children*. "Medical Record." 5th March, 1921.

THE author gives a fairly complete account of otitis in children with especial reference to its etiology, prevention and treatment. Special stress is laid upon the importance of watching for the occurrence of ear inflammation following upon respiratory infections.

The ear is attacked in either of two ways. During the ordinary colds of childhood swelling of the adenoid vegetations occurs with consequent interference with breathing and blockage of the nasopharyngeal space. Discharges therefore collect when the child is lying down, and during the acts of swallowing, coughing or gagging are driven outwards into the Eustachian tubes. Tympanic inflammation is thus easily initiated. In other cases a direct extension up the tubes of the inflammation leads to their occlusion and the formation of a closed infected cavity. A true hæmogenic implantation has not yet been proved to occur, but may be present in otitis of enteric, influenzal or pneumonic origin.

The flora of tonsillar and adenoid tissues includes the streptococcus hæmolyticus, streptococcus capsulatus and viridans. Similar organisms are present in the ear discharges.

Stress is laid on direct inspection of the tympanic membrane as the only reliable way of diagnosing otitis in its early stages in children. Redness and bulging of the membrane is diagnostic.

The prophylaxis of otitis lies in the early recognition and removal of adenoids. The author recommends the La Force box adenotome as the safest and most efficient instrument.

In the initial, pre-perforation stage, myringotomy, followed by two hourly irrigations through the ext. meatus, should be carried out. Care in protecting the delicate skin from irritation and eczema should be exercised. Borated vaseline is recommended.

J. S. J.

GYNÆCOLOGY AND OBSTETRICS.

WILLIAMS, J. WHITRIDGE: *The Problem of Effecting Sterilisation in Association with Various Obstetrical Procedures.* "American Jour. of Obstet. and Gyn." May, 1921, p. 783.

IN 58 supra vaginal hysterectomies following Cæsarian Section the body of the uterus was amputated in 18 cases primarily for sterilisation, in the remainder for various causes, intra partum infection, myomata, etc.

In 14 of these 18, pelvic contraction was the primary indication, in the other 4 the operation was for some disease threatening the patient's life; none of these 14 were primipara. The author says that whenever justified he performs supra vaginal hysterectomy, as he prefers it to conservative Cæsarian Section, on account of its more favourable prognosis.

In recent years the author has attempted to sterilise patients by more conservative means, such as doubly ligating the tubes, opening up the broad ligaments and bringing within them the uterine end of each tube.

The author holds that sterilisation is justified, at the third Cæsarian Section, and is inclined to believe that sterilisation after the second is too radical.

He enquires if his patients desire to menstruate or not, if not he removes the uterus, and if they do so desire he effects tubal sterilisation.

The convalescence from the more radical operation is generally smoother than after the conservative. It may be difficult to bury the ends of the tubes satisfactorily.

In considering cases in which sterilisation was effected during pregnancy, on account of the existence of incurable or progressive disease, there are three methods at our disposal. (1) Supra vaginal hysterectomy. (2) Opening the uterus and evacuating its contents, followed by the ligation of the tubes and burying their uterine ends. (3) Induction of abortion by the vaginal route followed by sterilisation later. The latter method he does not employ considering

it better to complete the operation at one sitting. The author says it may be asked why the ends of the tubes are buried, he says he cannot forget a case of Zweigels, in whom at a first Cæsarian Section both tubes were doubly ligatured and severed, and at a second Cæsarian Section both tubes were found to be normal and patulous.

R. E. T.

HORSFALL, F.: *Benign Neoplasms of the Female Pelvis*. "Canadian Med. Association Journ." 11. 5. 356.

THE subject is treated briefly from the historical and clinical standpoints. He has not attempted any new and much needed classification of ovarian tumours. He is a supporter of operative treatment for fibroids of the uterus, and quotes a famous surgeon who has stated "that as a curative palliative and diagnostic agent the aseptic scalpel in the hand of the careful, conscientious, and skilful surgeon stands without a peer."

BETHEL SOLOMONS.

MITCHELL, R.: *The Use of Pituitary Extract and Scopolamine-Morphine in Obstetrics*. "Can. Med. Association Journ." 11. 5. 351.

MITCHELL gives a necessary warning to those who employ pituitrin and scopolamine-morphine indiscriminately. He mentions authors who have published the principal papers on the subject, and sums up as follows:—In certain carefully selected cases and under certain definite conditions, both pituitary extract and scopolamine-morphine injections are of marked value in obstetrics. That when these conditions are not met with the results are disastrous. Both are potent drugs and are not to be given lightly or unadvisedly. That in times past the dosage has been too great. Single doses of pituitrin should not exceed eight minims. Doses of four or five minims are preferable. The total dosage before the uterus is emptied should never exceed sixteen minims. In scopolamine-morphine anæsthesia the initial dose should not exceed one-sixth grain of morphine or 1-150 grain of scopolamine. In repeating the latter drug not more than 1-200 grain should be given. Morphine should not be repeated. That scopolamine-morphine anæsthesia is more suited for use in hospitals than in private practice in homes.

BETHEL SOLOMONS.

CHEINISSE, L.: *Infection of Corpus Luteum Extracts in the Vomiting of Pregnancy*. "La Presse Medicale." 29. 31. 306. THE author favours the injection of corpus luteum for the vomiting of pregnancy, because, he states, as the corpus luteum increases in

the third month and then decreases gradually, and as this coincides with the usual time for vomiting it is a rational treatment. He quotes Hirst who used intramuscular injections as a beginning. The injection consisted of ampoules of 2 cmg. dissolved in 1 cc. of physiological salt solution with chloretone in view of the anæsthetic effect. The dose of the active principle corresponded to 15 centigrams of dessicated corpus luteum. The doses were repeated every 2 days. In a light case 5 doses sufficed. In more severe cases the dose was repeated daily for 12 to 15 days. In very extreme cases 1 cc. was given twice daily. No abscesses were seen, neither were there abortions, which is remarkable. A sedative effect was noticed. The treatment is contraindicated in goitre. Cheinisse states that quite encouraging results have been obtained in Paris by Devraigne and Lacourbas. He notes that Hirst is now using intravenous injections with excellent results. The advantages of this method are (1) the drug gets into the general circulation quicker, (2) large doses may be given with quicker results. In fact vomiting is stopped *promptly* by the intravenous method.

BETHEL SOLOMONS.

OPHTHALMOLOGY.

OSBORNE, T. B. AND MENDEL, L. B.: *Ophthalmic and Diet.*
 "Journal of the American Medical Association." April 2, 1921.

It has been noted by various observers that when rats were deprived of certain accessory food factors they were subject to the incidence of a characteristic infection of the external eye, which has been provisionally classified as a xerophthalmia.

In order to learn something of the incidence of the eye disease in their rat colony, to which no animals have been admitted from extraneous sources for several years, the authors have reviewed the statistics seriatim from the records of 1,000 animals, representing essentially the entire group under study during one year. It should be noted that all these animals were kept in the same laboratory. The cages in which they were maintained were sterilised twice a week, but the rats were regularly weighed in a common container, and the proximity of the open mesh wire cages to one another offered sufficient opportunity for the equal dissemination of contagion. The animals were not grouped according to any system of feeding, but were arranged in the cages in the order of their serial numbers, independent of the type of experiment for which they were being used.

The records of a thousand unselected rats showed the incidence of the eye disease to be—

	Total Number	Number with Eye Symptoms
On diets deficient in fat soluble vitamin ...	136	69
On diets deficient in water soluble vitamin (B)	225	0
On diets otherwise deficient	90	0
On diets experimental but presumably adequate	201	0
On mixed food (stock animals)	348	0
	<hr/> 1,000	<hr/> 69

From this summary it will be seen that although nearly one half of the thousand rats were on diets undoubtedly deficient, not a single case of the eye disease was observed in animals other than those experiencing a deficiency in fat soluble vitamin in the ration.

The eye disease was not the only consequence of the deficiency of a diet in vitamin A. Cessation of growth also took place.

The ophthalmia produced in these cases could not be cured by the usual procedures of local antisepsis, but the administration of vitamin A almost invariably caused the eye disorder to disappear.

A pathological report by Isabel M. Wason, M.D., states that the eyes showed congestion of the conjunctiva with a serous or seropurulent exudate in the conjunctival sacs. The eyes were swollen and reddened and frequently had lost their hairs. Corneal opacities of less or greater extent were seen in all but a few cases. Microscopic examination showed hyalinization or necrosis of the outer layer of corneal epithelium, exudation of serum and cells into epithelium and stroma, and a proliferation of blood vessels and fibroblasts.

W. C. MACFETRIDGE.

TRANSACTIONS.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

Section of Surgery.

A meeting of the Section was held on March 18th, 1921.

THE PRESIDENT, SIR W. I. DE COURCY WHEELER, in the chair.

Perthes' Disease.

MR. C. J. MACAULEY showed radiograms of two cases of Perthes' disease, one occurring in a boy of four and a-half, the other in a girl of seven. In both children there was a limp, with slight muscular wasting and limitation of abduction. The femoral heads showed flattening and fragmentation of the epiphysis.

Abdominal Aneurysm Eleven Years after Operation.

SIR WILLIAM I. DE C. WHEELER showed a man who was operated on in August, 1910, nearly eleven years ago, for abdominal aneurysm. Early in 1910 he had symptoms of dyspepsia with marked pain in his back. A pulsating tumour was discovered in the abdomen. There was a loud systolic murmur below the tumour traceable downwards along the iliac vessels. Expansile pulsation was easily demonstrated and aneurysm of the cœliac axis was diagnosed. On August 30th, 1910, the patient was placed in the Mayo-Robson position for gall-bladder operations and the aneurysm exposed. The gastro-hepatic omentum was adherent to the sac. It appeared that the aorta and all the branches in the region of the cœliac axis were involved in the sac. A cartridge containing a cage of 150 inches of Colt's wire was placed in position, and the wire introduced into the sac. The puncture point was strengthened by a few sutures. There was a history of syphilis and the patient was treated accordingly with "606." The man is at present in good health, working as a labourer, the Wassermann reaction is negative, and a hard tumour with only transmitted pulsation can be felt at the site of the old aneurysm. Sir William Wheeler thought that the pain in the back in cases of aneurysm was not as a rule due to erosion of the vertebræ, but to the heaving and tugging of the posterior parietal peritoneum. He thought this case was one of the longest alive and well after the wiring of an abdominal aneurysm. He quoted a second case in which he wired an abdominal aneurysm, but the aneurysm in this case seemed to be obstructing the pylorus, and gastro-enterostomy was done. The patient died of intestinal obstruction due to pressure on the anastomotic loop, between the aneurysm and the abdominal wall.

A third patient operated on in 1912 died two years later with a

rupture of a second aneurysm. The man at the time of rupture was a stoker on board a steam trawler during the war. The *post-mortem* specimen showed the original aneurysm firmly consolidated with blood clot with the wire *in situ*.

Reconstruction of the Upper Arm.

SIR WILLIAM WHEELER also showed a case with photographs before and after operation, and skiagrams, of a pensioner who lost the upper third of his humerus and all the muscles and skin round the shoulder joint. The arm was hanging to the trunk by a small flap containing the nerves and vessels. Below the acromion process there was dense scar tissue about a large hand's breadth in extent. The reconstruction of the upper arm was successfully attempted, the scar tissue was removed, the pectoralis muscle was detached from the chest and humerus and swung outwards so as to replace the deltoid muscle. The blood vessels and nerve supply were preserved. A skin flap was obtained from the chest and back. The humerus was replaced by an intramedullary bone graft, the upper end of which was brought into contact with the scapula as far up as the coracoid process. The x-ray photographs taken periodically showed a gradual increase in the thickness of the graft until at the time of exhibition it had reached the size of the normal humerus. There was firm ankylosis between it and the scapula. The arm was in the abducted position. By means of scapular movements the patient could move his arm in all directions and his hand could be brought to the back of his head. The transplanted pectoral muscle, however, had undergone atrophy and did not function.

Occipito-Cervical Neuralgia.

MR. W. PEARSON showed a case of occipito-cervical neuralgia successfully treated by nerve division.

Retrograde Intussusception.

MR. A. BLAYNEY showed a specimen of retrograde intussusception in the transverse colon successfully removed by operation. He suggested that the condition might be correlated with anti-peristalsis.

VENTRICULOGRAPHY.

MR. ADAMS McCONNELL read a paper on Ventriculography. (See *Dublin Journal of Medical Science*, April, 1921, p. 145.)

A New Method in Pituitary Surgery.

MR. A. K. HENRY read a paper on a new method in pituitary surgery. (See *Dublin Journal of Medical Science*, April, 1921, p. 163).

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Original Communications.



RECONSTRUCTION OF JOINTS.

By SIR W. I. DE COURCY WHEELER.

OPINIONS are divided as to the relative merits of arthroplasty and excision in the treatment of many stiff and diseased joints. In certain cases the indications for one or the other are comparatively clear. The pendulum has swung rather back towards excision in the case of the elbow-joint; both operations yield satisfactory results in the case of the shoulder, but, in ankylosis of the hip, stability is so essential that, if a mobilising operation is indicated (a rare contingency), most surgeons will prefer arthroplasty to excision.

Reconstruction of Ankylosed Knee-Joints.

There is almost unanimity of opinion concerning the knee, namely, that sound ankylosis in the great majority of advanced cases is the only desideratum. Reconstruction of an ankylosed or diseased knee-joint with a view to the restoration of movement has been summarily dismissed by many authorities as an operation based on unsound principles and rarely followed by success. The following case is reported to illustrate that this condemnation, although justifiable in a general way, has been too emphatic, and that in certain cases success may be anticipated:—

In August, 1919, a little girl, age 11, gave a history of

acute osteomyelitis of both tibiæ, a prolonged illness, and frequent operations. Numerous scars, the result of healed sinuses and operation wounds, were in evidence down the front of both shins. Both knee-joints were firmly ankylosed. The left knee was ankylosed in flexion, the right in extension. X-ray photographs showed firm bony ankylosis, with destruction of the epiphyses of the femur and tibia on both sides (Figs. 1 and 2).



Fig. 1.—Right knee-joint ankylosed in extension.

The parents were told that the general opinion of surgeons was against operation, that lateral stability could not be ensured, and that in the absence of crucial ligaments it was difficult to prevent the tibia rocking backwards and forwards on the femur. Lateral mobility, and forward and backward play of the tibia on the femur, with a want of check on inward rotation of the tibia, might render the knees so inse-

cure that walking without aid might be quite impossible. These were the orthodox arguments against operation. On the other hand, it was pointed out that much could be done in the remodelling of the bones at operation to promote security for weight-bearing, and that the formation of a capsule and ligaments might be expected in time, such as is seen surrounding a false joint, the result of an old ununited fracture of the long bones.

In September, 1919, an operation was performed on the left (flexed) knee, after the manner recommended by the late J. B. Murphy. An incision was made about 4 in. long



Fig. 2.—Left knee-joint ankylosed in flexion.

on either side of the patella, slightly curved with concavity backwards. The skin was reflected freely, and two tongue-shaped flaps of fat and fibrous layer of the capsule were fashioned, the base of each flap being downwards, attached over the internal and external surfaces of the upper extremity of the tibia. A Jones gouge was easily driven through the new bone binding the femur and tibia, and the knee was fully flexed. The lower end of the femur and the upper end of the tibia were cleared of all irregular bone, and both surfaces fashioned to leave as large an amount of bone in a lateral diameter as possible,

and thus diminish the tendency to lateral instability. A mortise in the form of a substantial groove (not well shown in the skiagrams) was made from front to back on the surface of the femur, and a corresponding tenon cut in the tibia to limit the lateral gliding of the one bone upon the other. Care was taken to remove slightly more bone from behind in order to diminish any tendency to hyper-extension. The flaps were now placed loosely across the upper end of the tibia and fixed by a few points of suture in position.

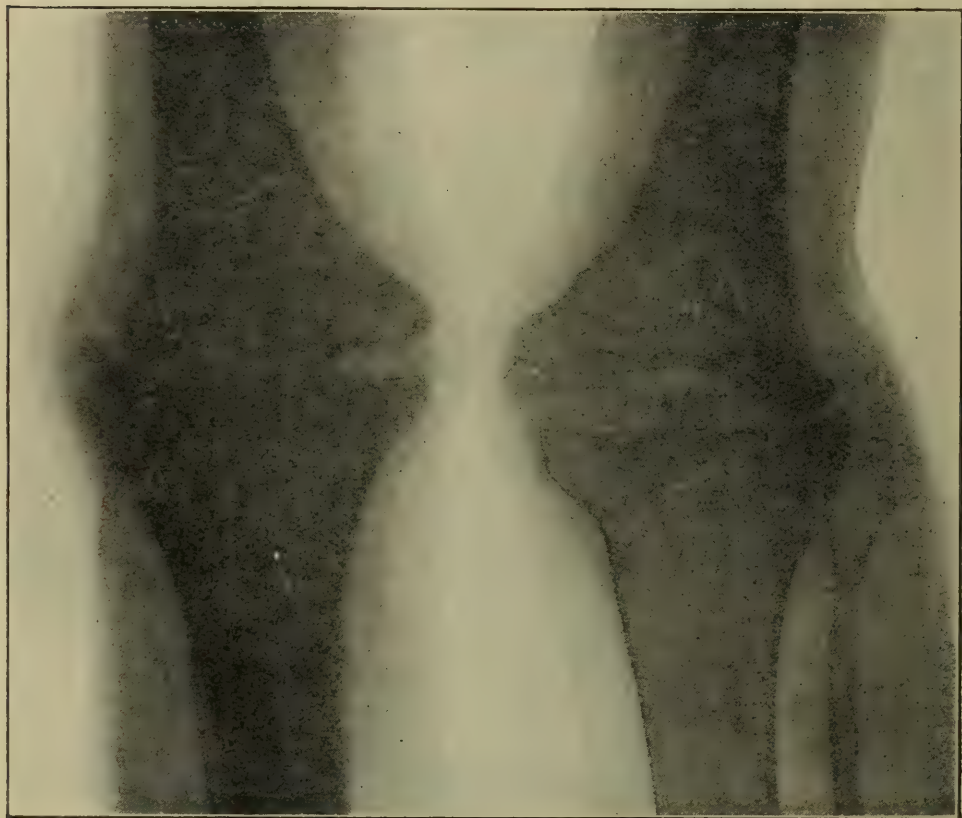


Fig. 3.—Both knee-joints in extension after operation.

The extensor apparatus was unduly lax when the flexed joint was brought into the straight position, and the patella was “turned turtle” with great ease—a manœuvre which prevents subsequent fixation to the front of the femur.

There was little or no pain after operation, and the stitches were removed after eight days. The leg was immobilised on a simple back splint.

After removal of the stitches the child was encouraged to

move the joint actively as far as possible as it lay unbandaged on the splint. There was a striking absence of pain. The knee moved actively a few degrees in flexion and extension after the first dressing. The child gave this demonstration to every visitor, until, in an astonishingly short time, voluntary flexion of the joint to half a right angle was possible. Great care was taken to prevent any movement in a lateral direction. Massage and passive movements were

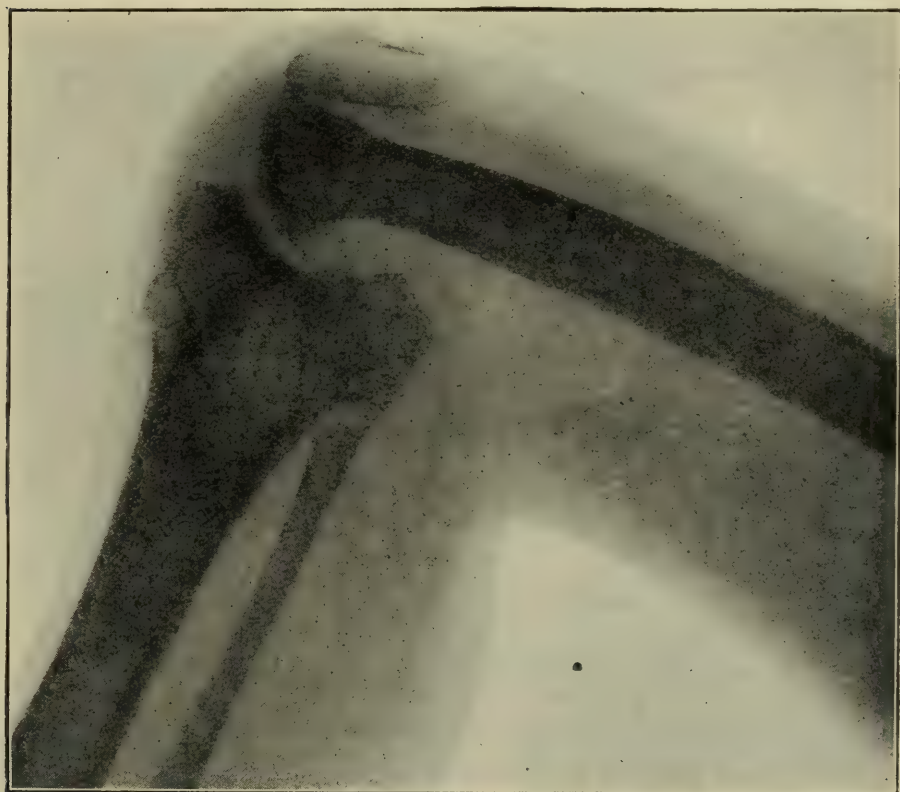


Fig. 4.—Showing amount of voluntary flexion in left knee-joint 2 years after operation. Note the patella 'turned turtle.'

employed after the first fortnight to hasten the development of the wasted quadriceps. The child was discharged two months after operation on a calliper splint jointed at the knee. She could walk now with easy voluntary flexion of the left knee to about half a right angle and without pain.

The absence of pain on either active or passive movements interested me, for to this phenomenon the success of the operation is in a large measure due. The child regarded the after-treatment from the start as being something in the

nature of a game, and worked hard in her efforts to give satisfaction and surprise as we daily watched the return of the joint to something approaching normal.

The absence of pain after operation is due probably to the removal of any remains of the old lateral ligaments and capsule of the joint which carry the sensory nerves.* Murphy states that, in addition to affording a wider range of motion in the new joint, removal of the ligaments together



Fig. 5.—Showing the amount of voluntary flexion in right knee-joint 18 months after operation.

with the capsule also obviates one of the causes of post-operative pain. I cannot think of anything more important to obtain a good result in arthroplasty operations than prevention of pain. The early after-treatment is simplified a hundredfold.

Six months after the first operation the patient was re-admitted into the private hospital, and a similar operation undertaken on the second knee. The joint on this occasion

* Ligaments receive nerve fibres both sensory and vasomotor. The nerve fibres always come from the same nerves that supply the muscles moving the joint and supplying the overlying skin (Rudolph Fick).

was straight and not flexed, and the operation was rendered more difficult in consequence. The quadriceps extensor tendon and the patellar ligaments were tense, and the patella could not be turned turtle as in the previous instance. A flap was fashioned and inserted between it and the femur in addition to the main intra-articular flap.

The after-treatment was modified and improved upon. Extension was maintained by means of a Thomas knee bed-



Fig. 6.—Snap-shot photograph of left knee, child walking.

splint which was daily loosened for massage and active movements. As before, there was no pain, and the child co-operated admirably with the efforts to promote movement and develop the muscles.

Two months later she was discharged, still wearing a

jointed calliper splint on the left leg and a jointed leather moulded splint from groin to ankle on the right.

She presented herself for examination two years after the first operation and eighteen months after the second. She is walking freely without splints or crutches, and but for a slight forward bend of the body, a habit contracted to obtain better equilibrium, her gait is to the ordinary observer almost normal (Figs. 6, 7).



Fig. 7.—Snap-shot photograph of right knee, child walking.

Sir Robert Jones saw the patient in the early stages of treatment when he was visiting Dublin.

She was exhibited at the Royal Academy of Medicine in Ireland, and, when asked to hop across the room, did so with agility. There is a little lateral mobility, but not more

than is often seen following stretching of the ligaments after prolonged effusion or extension in the treatment of injuries. In this connection Murphy states: "In the early days of our arthroplasty work we felt that something serious would happen if we totally removed the articular ligaments. As time went on, however, I learned that large ligaments developed about the site of a pseudarthrosis." This statement is probably correct. If no movement is allowed during repair in the lateral direction, there will be a corresponding condensation of the connective tissues on each side. On the other hand, movements are secured in desired directions from the earliest moment. Connective tissues trained in this way eventually take on the form and function of ligaments.

The object of this communication is not to advocate the operation of arthroplasty of the knee-joint, but to show that under favourable circumstances, when there are real indications for the operation, there is a reasonable prospect of success.

I have to thank Sir Robert Jones for his kindness in examining this case when on a visit to me in Dublin, Prof. A. F. Dixon for information about the nerve supply of joints, and Dr. Garratt Hardman for the trouble he took in connection with the *x*-ray plates.

Reconstruction of the Shoulder.

The operative possibilities in cases passing through hospitals for disabled pensioners as time goes on are becoming less and less. During the three years since the war the majority of the patients have been operated on once or many times, and a halt has been called in most cases to all but purely non-operative orthopædic methods of treatment. There are cases still which are admitted for conditions of non-union, mal-union, and cross-union of bones capable of repair, but they are rare.

The same applies to joints, nerves, and muscles, although here, too, some cases appear to have drifted from one place to another without the obvious rational operative treatment having been tried.

The following case illustrates the last statement:—

A pensioner, aged about 25, was wounded in November, 1918, by a high-explosive shell. The right shoulder below the acromion process was carried away *en masse*, skin, muscles, and bone, leaving only a pedicle on the inner side carrying the main vessels and nerves by which the arm hung helplessly to his side. The wound was septic and unhealed for eighteen months.



Fig. 8.—Pensioner K. Wounded, 1918. The right arm is seen hanging from the trunk by a pedicle containing the vessels and nerves. The skin, deltoid muscle, and upper end of the humerus were blown away.

On admission, a dense cicatrix occupied the right deltoid region. The area of the scar extended backwards over the lower scapular region, and forwards over the insertion of the pectoralis major muscle (Fig. 8). The movements in the hand were strong and free. All the muscles of the upper arm were out of action; nevertheless, he could flex and

extend the elbow with considerable strength. This trick was accomplished by fixing the extensors and flexors of the forearm below and contracting them on their attachment to the condyles of the humerus, thus producing flexion and extension of the elbow and an excellent mimicry of the normal action of the biceps and brachialis anticus muscles. Fig. 9 shows a skiagram taken at this time.

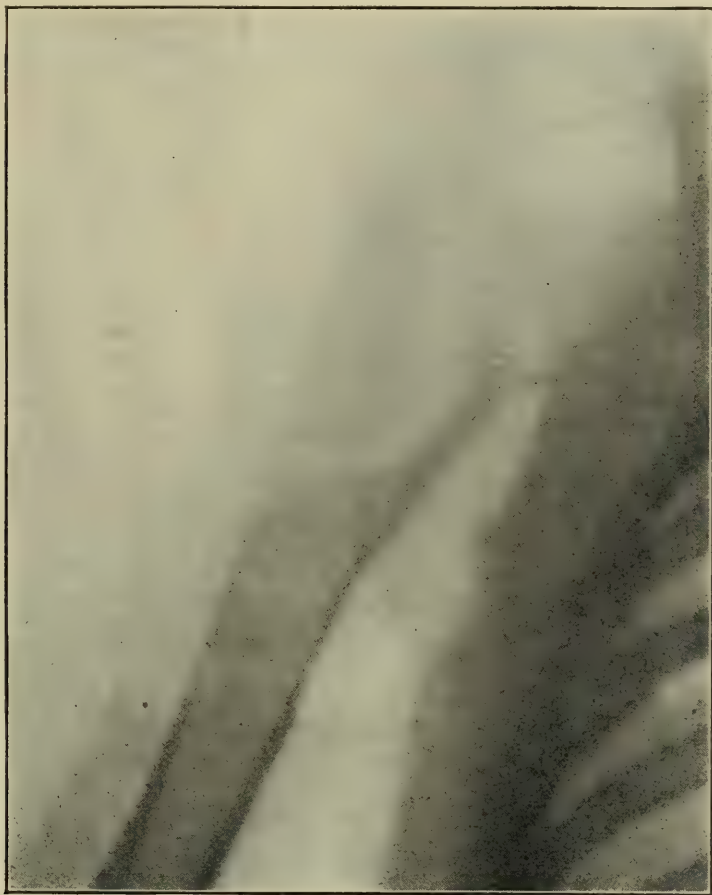


Fig. 9.—Skiagram of patient on admission, showing absence of upper end of the humerus.

The patient had been told so often that nothing could be done to restore the shoulder and upper arm, that consent to operation was only obtained on condition that it was completed in one stage.

The scar was subjected to massage, radiant heat, etc., in the hope of lighting up any latent sepsis, if such existed, before a major operation was attempted.

OPERATION, April, 1920:—

1st Stage.—Two incisions were made, one just below the acromion process extending forwards under the clavicle and backwards beneath the spine of the scapula above the cicatrix. The second skirted the cicatrix below at the level of the middle of the shaft of the humerus. The incisions met in front and behind so as completely to encircle all the scar tissue. The dissection was slow and tedious, as the scar (the result of old sepsis) had penetrated deeply in the position corresponding to the shoulder-joint. After removal of the scar, a deep hiatus was left between the acromion process and the upper end of the fractured humerus; the arm hung like the sleeve of a coat from the inner flap containing the vessels and nerves.

2nd Stage.—The upper end of the humerus was cleared and divided until healthy bone appeared, and all irregularities were removed. The glenoid cavity was exposed and an effort was made to freshen the surface.

3rd Stage.—A bone-graft 9 in. long was removed from the inner surface of the right tibia with the Albee twin saw, regulated so as to cut a graft of tight fit for the medullary cavity of the humerus. The graft was driven tightly into the humerus for four inches. The arm was abducted and held in position so that the graft lay along the glenoid cavity, the upper extremity touching the acromion and coracoid processes (Fig. 10). The intention was to obtain a broad union between graft and scapula with the arms in slight abduction.

4th Stage.—Five inches of the graft lay bare, with no skin, muscle, or other soft tissues for a covering. To remedy this a plastic operation of some magnitude was necessary. A large pedicled skin-flap was fashioned from the front of the chest, and the skin above and below the original incisions freshly undermined. A skin covering was obtained, but it was obvious that this was insufficient for the graft, although ample so far as the wound area was concerned. It was decided to replace the destroyed deltoid muscle by transplantation of the clavicular portion of the pectoralis major outwards as described by Emslie. The attachment of the muscle to the clavicle was separated subperiosteally, and the clavicular portion isolated from the sternal. The

tendon attachment was severed, so that now the muscle lay quite free but for a pedicle which contained the vascular and nerve supply. The detached muscle was swung outwards over the bone-graft, and attached to the acromion process and clavicle above by a few points of suture. Below it was

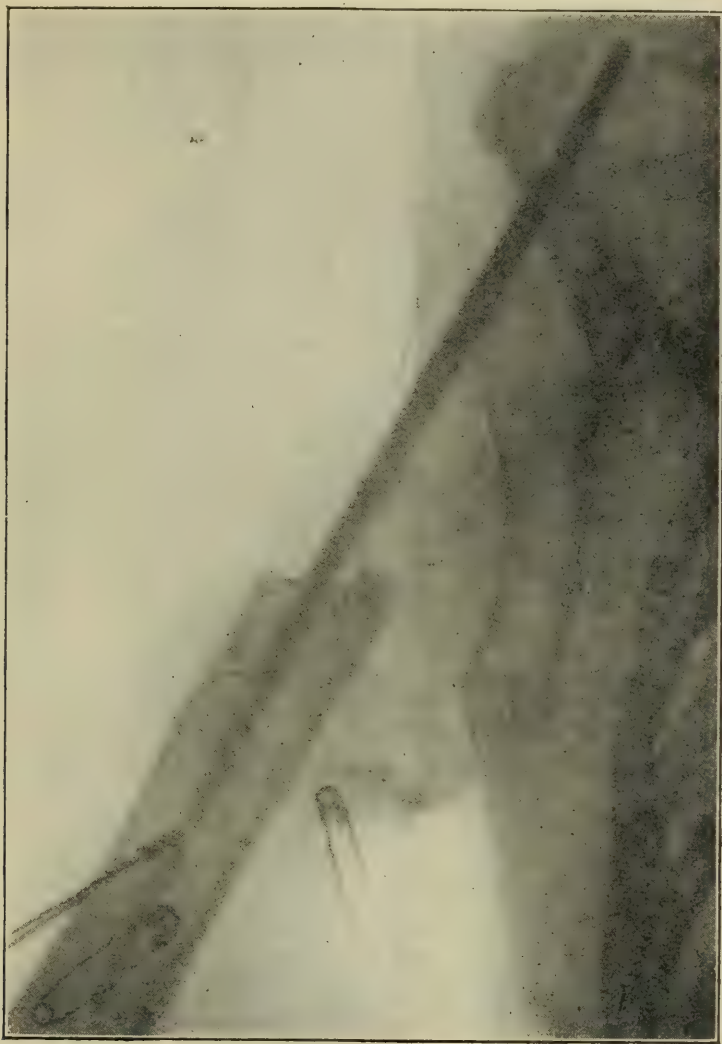


Fig. 10.—Skiagram taken immediately after operation; four inches of the graft is intramedullary, the upper portion is in contact with the glenoid cavity, the coracoid, and the acromion.

sutured to the periosteum and soft tissues round the humerus in about the position where the normal deltoid gets insertion.

The clavicular portion of the pectoralis major has successfully replaced a deltoid destroyed by injury, good abduction

of the arm resulting; but in the present case, as ankylosis of the bone-graft with the scapula was aimed at, the muscle-graft was used merely to give ample covering to the bone.

The skin flap was now sutured in position and the undermined margins were brought into line. The operation occupied two hours.

The arm was carefully immobilised on an abduction splint. The stitches were removed in a fortnight, and the splint was replaced by an extensive plaster casing.

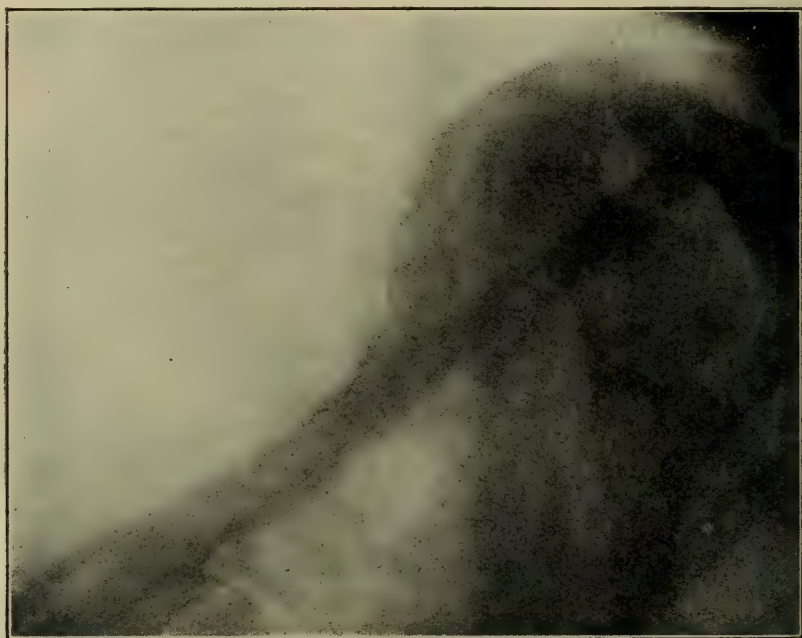


Fig. 11.—Skiagram 3 months after operation—‘the period of anxiety.’ The loss of density in the graft due to the destructive powers of osteoclasts is more apparent than the regenerative osteoblastic process at this date.

For three months rigid immobilisation was insisted upon, as is the custom, and afterwards slight stresses and strains were permitted in conjunction with massage and active movements to stimulate growth in the graft.

The behaviour of the bone-graft in this case illustrates many interesting points. The growth is seen in the photographs taking place at the side of the graft remote from the periosteum. The skiagram taken three months after operation (Fig. 11) demonstrates a condition which gives rise to anxiety in many grafting operations about this period. There

is a mottled irregular appearance in the portion not directly contacted with bone, and an alarming loss of density. It is difficult to foretell at this stage whether the graft is about



Fig. 12.—Skiagram six months after operation. There is firm union at the upper end of the humerus and at end above the glenoid cavity. Between these points the graft, in accordance with Wolff's Law, has increased considerably in girth and density. The intramedullary portion is becoming absorbed.

to crumble and become absorbed, or whether appearances are deceptive, and the loss of density is due to the fact that at first the demolishing powers of the osteoclasts are more apparent in the photographs than is the reproducing capa-

city of the osteoblasts. It must be assumed that the activity of both classes of cells goes on simultaneously in successful cases, the osteoblasts inserting a new brick in the structure as the old ones are removed *pari passu* by the osteoclasts. Sometimes, however, in the grafts that fail, osteoblastic action is absent, and this cannot be told by



Fig. 13.—Skiagram 9 months after operation. The graft has replaced the upper end of the humerus. The intramedullary portion, to which no strains or stresses are now transmitted, has almost disappeared. There is firm union with the scapula.

x-rays, for bone-formation in the embryonic stage is translucent and does not cast a shadow.

The photograph taken six months after operation dispelled anxiety, for now a buttress of dense new bone could be seen on the medullary side of the graft and the density of the whole had considerably increased (Fig. 12). The increase

of density and thickness was confined to the portion of the graft bearing stresses and strains, namely, between the upper end of the humerus and the glenoid cavity. There was firm ankylosis at these two points.

Thickening of the portion of graft inserted into the humerus, and also of that portion above the glenoid cavity, is seen in the second photograph, where stresses and strains, if any, were distributed over the whole graft; but after ankylosis had occurred at the glenoid and the extreme upper end of the humerus, the intramedullary portion and the portion above the glenoid were inert, and absorption is taking

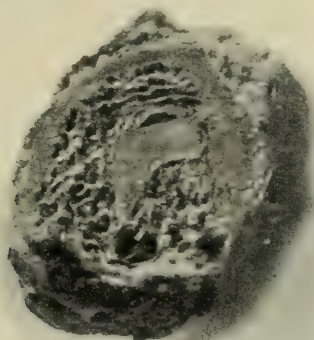


Fig. 14.—Section of humerus showing peg graft introduced six months previously. Note the firm incorporation of the graft with surrounding bone.

place, especially below. More active movements and a more general use of the arm were allowed later, and with the movements of the scapula some strain was evidently transmitted to the portion above the glenoid, which became more solid and dense. The graft below united beautifully to the upper end of the humerus, and there was no further use for the intramedullary portion, which is seen attenuated and about to disappear (Fig. 13)).

The condition of the patient before operation is well shown in Fig. 8, and fourteen months after operation the patient is shown (Fig. 15) holding a vessel weighing $5\frac{1}{2}$ lb. at arm's length during a time exposure. He can use his arm freely, and almost place his hand to the back of his head. The scapular movements are increasing in range, and the muscles of the upper arm have recovered

Fourteen Points About Bone-Grafts.

1. A loss of density apparent in a graft as shown by *x*-ray photographs a few weeks after operation is deceptive and does not necessarily indicate absorption and failure. In the early stages the demolishing activity of the osteoclasts is often more apparent than the bone-producing power of the osteoblasts.

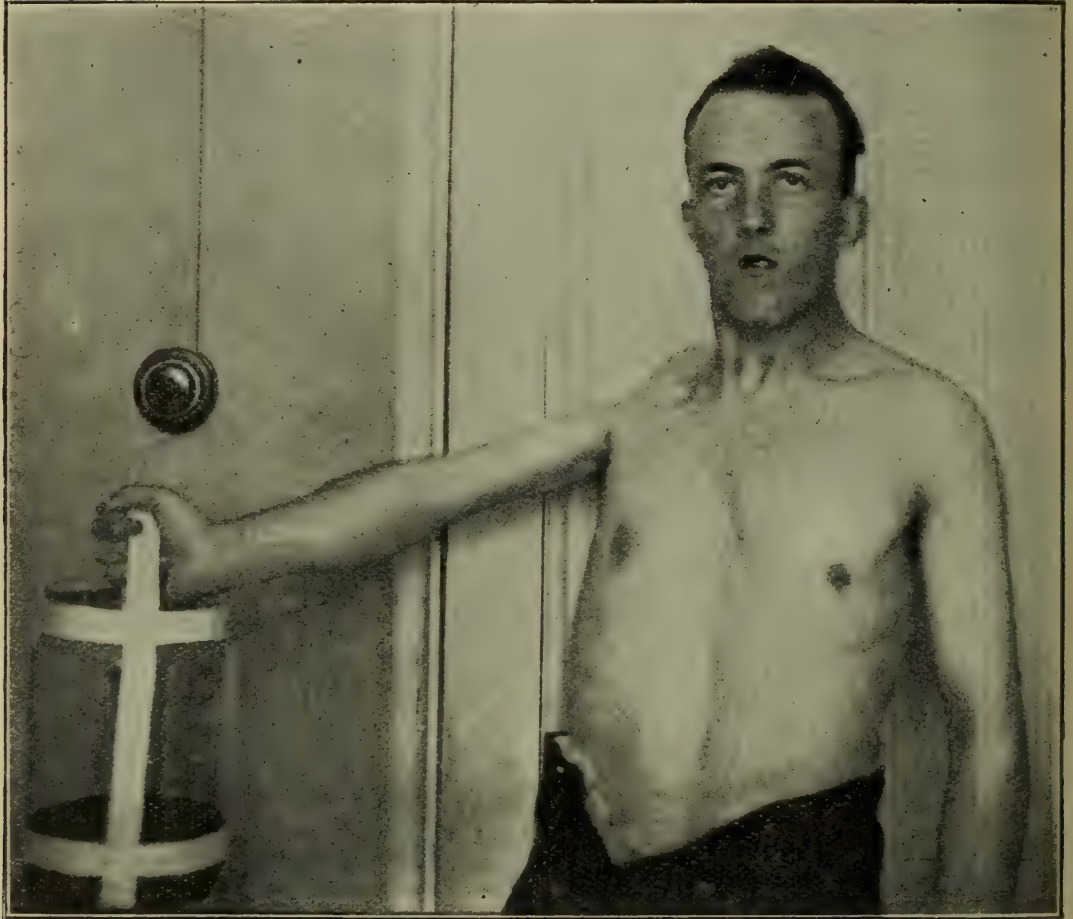


Fig. 15.—Patient 14 months after operation holding a vessel $5\frac{1}{2}$ lb. in weight at arm's length for a time-exposure photograph.

2. The final success of bone-grafting depends upon the operation of Wolff's law, that is, the graft, stimulated by strains and stresses, changes its internal architecture and external conformation until the required strength is attained. In other words, "the amount of growth in a bone depends on the need for it" (Murphy).

3. To provide the necessary strains and stresses, it is advisable to allow the graft to functionate after preliminary fixation for about three months.

4. The periosteum should be left on the graft, because, although not essential, it is the medium through which new blood-vessels enter the graft and the surrounding structures. Furthermore, in removing the periosteum, superficial layers of osteoblasts even in an adult may be sacrificed. A periosteum-covered graft is therefore less likely to become absorbed.

5. In old ununited fractures with false joints the bone in the "critical area" (near the site of fracture) is sclerosed and non-vascular, and makes unsuitable soil for that portion of the graft in contact with this area.

6. In such cases a graft, instead of exhibiting osteogenetic powers and responding to Wolff's law, may become attenuated and absorbed, or break in the critical area (at or just above or below the line of fracture), five or six months after operation.

7. In the same class of case very prolonged fixation is particularly unfavourable to osteogenesis, to the establishment of blood-supply, and bony union. Early movements and the bearing of mechanical stress and strain, on the other hand, may lead to yielding of the graft and failure. The problem is a difficult one in the case of the humerus or femur, where strength is essential. Wide resection of the sclerosed bone, with resignation on the part of the patient to a short limb, is the only remedy when non-operative methods fail.

8. A graft must not be used to span a gap in the humerus or femur—it breaks or absorbs. The freshened ends of the fractured bone must be in apposition, and the graft used as a support. This does not apply to grafting of the radius and ulna, nor when a graft is used to replace entirely the lost extremity of a bone.

9. But for slightly slower osteogenetic powers the intramedullary peg is effective. This method of bone-grafting is satisfactory and simple in practice, although faulty in theory.

10. The bone-graft has inherent bacteria-resisting pro-

perties : sepsis does not necessarily mean loss of the graft.

11. Absolute fixation of the graft in its bed for about three months, secured either as part of the operation, or afterwards by splints or plaster, is essential to success.

12. Bone-grafting for spinal caries is followed by more uniformly successful results in adults than is seen elsewhere. This is to be expected, since both the graft and the recipient bed (in the region of the spinous processes) consists of healthy bone.

13. As in the operation of tendon transplantation and nerve suture, the operation of bone-grafting should be preceded by correction of any existing deformity and by the freeing of adhesions in neighbouring tendons and joints.

14. Identical grafts behave differently in apparently similar cases, and no emphatic prognosis can be given for many months.

A CASE OF DIFFUSE SCLERODERMA.*

By SIR JAMES CRAIG.

THE patient, a strongly-built, well-nourished, male farmer, aged 34 years, had influenzal pneumonia two years ago. Six months ago he observed the skin on both sides of the base of his neck becoming stiff, thick and firm; "it felt like corduroy." The skin of the flanks was next affected, then that of the hands and forearms—the latter more on the extensor than the flexor aspect—and finally that of the face. Except in the supraclavicular regions and around the lower part of the back of the neck, where it feels ridged or ribbed, the skin on the face, shoulders, front of chest, front of lower part of abdomen, hands and forearms, and to a slight degree on the thighs is smooth, hard, thickened and cannot be pinched up with the fingers. The face is smooth, pale and expressionless, the lower lip is vertically wrinkled. The front of the chest is smooth as a billiard-ball, yellowish in appearance and with dilated capillaries on the surface. On the abdomen the smooth, thickened, firm, unpinchable skin shows a brownish pigmentation interspersed with numerous white spots.

The hands when grasped feel almost as hard as wood, are cold to the touch and pale of colour. The fingers, which can be fully extended, can be flexed only to within an inch of the palm; their tips are flattened and present small cicatricial marks resembling those seen in syringomyelia. The nails are pale and smooth, the skin covering the lunule being ragged. The palms of the hands are moist with perspiration. The history of the march of events in the case of the hands is strongly suggestive of Raynaud's disease. The lower extremities have escaped for so far except on the front of the thighs, where the skin is only slightly thickened and œdematous. The calves perspire profusely. Sensation is normal everywhere. Itchiness particularly about the shoulders has been very troublesome. The heart and lungs are healthy. The urine is free from albumen and sugar. Joint pains are absent. Gastric discomfort after meals, and constipation are pronounced. Blood examination reveals, Hb. 80 per cent.; reds, 7,000,000; whites, 12,000 per cmm.

*Exhibited at Section of Medicine, Royal Academy of Medicine, April 22nd, 1921.

DISABILITY ASSOCIATED WITH A CONGENITALLY SEPARATE TUBEROSITY OF THE TARSAI SCAPHOID.

By ARNOLD K. HENRY.

VARIATIONS in the number of tarsal bones are common, and radiologists are often in danger of confusing additional tarsal elements with fractures of the tarsus. As a rule, however, such additions are purely of medico-legal or anatomical importance; they are discovered by chance in a radiogram or a dissecting-room.

The following case, on the other hand, is of clinical interest, and is, I believe, the first in which disability has been recorded in connection with an additional scaphoid element.

The patient, an ex-soldier, aged 25, had a gunshot fracture of the left tibia consolidated in good position. This apparently did not inconvenience him. His complaint was of pain over the scaphoid bone of the left foot, which he declared had never been injured. The skin covering the tuberosity was normal, but the bone seemed larger than that of the right foot. I was interested when I saw him in recent descriptions of Köhler's disease (isolated disease of the tarsal scaphoid in children) and, suspecting some similar condition, I had both feet *x*-rayed. Each foot, however, revealed a congenital separation of the scaphoid tuberosity. Comparison of the two bones in the accompanying figure shows that in the right foot, where there was neither pain nor any other symptom, the shadow of the additional ossicle is that of a smooth bone, conical in outline, and very clearly marked off from the base of the tuberosity, while in the painful left foot the ossicle is more slender and presents a sharp and well-defined hook below the head of the astragalus: the articular line is irregular.

It is obvious that there is here no question of fracture. In each foot the number of tarsal bones is increased from seven to eight by the separation of an element usually incorporated with the scaphoid tuberosity.

Manners-Smith in an elaborate study of the tarsal

scaphoid recognises three distinct elements in the constitution of its tuberosity: (1) a projection of the body of the scaphoid—an apophysis; (2) an epiphysis; and (3) a sesamoid element in the tendon of the tibialis posticus. So far, I believe, the three elements have not yet been found completely separate from one another in the same subject, but Manners-Smith figures a scaphoid with an ossicle lying in the region of the tuberosity which shows a distinct tendency to subdivision. Many anatomists believe that the



LEFT FOOT.

RIGHT FOOT.

Radiogram showing additional scaphoid elements in both feet, associated with disability in left foot only.

third element, the so-called sesamoid of the tibialis posticus, is really a true part of the skeleton of the foot; according to Pfitzner it is never enclosed within the tibialis tendon. Dwight in his *Variations of the Bones of the Hand and Foot*, page 18, states that it appears as a separate cartilaginous element in the region of the tuberosity in the second month of intrauterine life. Pfitzner describes the additional ossicle as the *tibiale externum* without distinguishing epiphyseal and sesamoid components in its constitution.

As a rule the additional element of the scaphoid is joined to the tarsus by fibrocartilage, but a true joint-cavity between the ossicle and the scaphoid has been described (Dwight, loc. cit.).

As regards the disability in my case it is worth noting that the scaphoid, lying as it does near the summit of the longitudinal arch of the foot, is subject in a special degree to stress. Further, it is pulled upon by the inserted tibialis posticus, and lastly, it is still cartilaginous and plastic when the ossification of the other tarsal bones is already established.

The existence of Köhler's disease shows that the scaphoid may be the seat of a particular vice of ossification which leaves the rest of the foot unaffected. It is therefore not unlikely that the presence of an abnormal ossicle in a specially stressed and potentially plastic region of the foot should constitute a place of diminished resistance, particularly when it is possible that a joint-cavity between the ossicle and the scaphoid may be involved in the stress.

The gunshot wound of the tibia in my case may have played a part in determining the pain over the scaphoid area, a part which in the absence of obvious deformity remains obscure. Possibly, too, the sharp point of the hooked ossicle may have been a factor.

I saw recently a golf-professional with a similar but more minute spicule projecting from an injured sesamoid of the great toe. The pain as he turned on the ball of his foot was spoiling his swing.

REFERENCES.

Dwight: *Variations of the Bones of the Hand and Foot*.
Manners-Smith. *Jour. Anat. and Phys.*, XLI., p. 255.

MEDICAL EDUCATION.

THE system of medical teaching in Ireland differs from that in England in important particulars. In London each clinical hospital has its attached medical school, fully equipped, which educates the students of that hospital and very seldom those of any other. In Dublin, on the contrary, the hospitals and schools are entirely separate, and a student of any school is free to enter for the whole or any part of his course at any school or hospital he pleases.

Cost of Education in Ireland.

School of Physic, Dublin University ...	£124 17
Royal College of Surgeons' School ...	124 19
National University Colleges ...	124 19
Queen's University, Belfast ...	105 0

Cost of Diplomas or Degrees.

Dublin University—£27 (to this must be added £83 4s., the cost of obtaining an Arts degree).

National University ...	£19 0
Queen's University, Belfast ...	19 19
Conjoint Royal Colleges ...	42 0
Apothecaries' Hall ...	22 1

Thus, the absolute payment will amount to somewhere between £125 and £233 1s., according to the course chosen. For the Conjoint Colleges the entire cost is £166 19s., taking the minimum mode of payment. So that, assuming that extras or voluntary costs are incurred, the total will vary, say, from £170 to £200.

All the schools require fees for each course to be paid in advance.

Women are admitted to all the courses, degrees and licences on the same terms as men.

Date of Entry.

The entry of names and commencement of study in Ireland is *supposed* to date from the 1st of October in each year, but entries are accepted for some weeks later. The student must attend three-fourths of the lectures delivered.

Preliminary Examinations.

The first act of the student is to pass a preliminary examination. The next is to commence medical study. This he does by entering for lectures at a medical school. From the school registrar he gets a form of certificate, and his third act is to take it or send it to the Branch Medical Council, 35 Dawson Street, Dublin, unless, as is usually the case, this duty is undertaken for him by the school registrar. He is thereupon placed upon the Register of Medical Students (without fee), and his period of study counts from that date.

The only preliminary examination held specially for medical students is that held conjointly by the Royal Colleges of Physicians and Surgeons, but other examinations—e.g., the public entrance at Trinity College, the matriculation of the National and Queen's Universities, and the Intermediate Examination passes in the required subjects, are accepted as equivalent.

The subjects of examination as prescribed by the General Medical Council are as follow:—(1) English language, including a specified author; dictation, grammar, and composition; also parsing and analysis from a book specified; (2) Latin, including grammar, translation from specified authors, and translation of easy passages not taken from such authors. (3) Elements of mathematics, comprising (a) arithmetic, including vulgar and decimal fractions; (b) algebra, including simple equations; (c) geometry, Euclid, Books I., II., III., with easy deductions. (4) One of the following optional subjects:—(a) Greek; (b) French; (c) German.

THE UNIVERSITIES.

The University of Dublin.

The University of Dublin grant the degrees of M.B., B.Ch., and B.A.O. to students who have obtained their B.A. degree, and who have been for at least five academic years on the books of the Medical School, and the higher degrees of M.D., M.Ch., and M.A.O., to graduates of certain standing who hold the degrees of M.B.S., B.Ch., and B.A.O. It does not grant degrees to any but graduates in Arts, and consequently its degrees hold a high rank and are

sought for by those who look forward to occupying the best positions in the profession. Diplomas, entitling to registration, are given on certain conditions to non-graduates.

The expense of obtaining the degrees of M.B., B.Ch., and B.A.O. is approximately as follows:—Lectures, £73 10s.; Hospitals, £55 13s.; Degree Fees, £17—total, £146 3s.

The expense of the B.A. degree, amounting altogether to £101, should be added, making the total cost £247 3s.

In addition to its ordinary qualifications the University grants the following degrees and diplomas:—

Doctor of Medicine.—To obtain this the candidate must have passed the final examinations and be of M.A. standing. He must send in a thesis for approval. Subsequently the Regius Professor of Physic and an assessor will discuss with him questions connected with the thesis and may examine him *viva voce* on medical subjects of a more general nature. Fee for this degree, £20.

Master of Surgery.—The candidate must be a Bachelor in Surgery of three years' standing, and must then pass an examination in clinical surgery, operative surgery, surgical pathology, surgery, and surgical anatomy (on the dead subject). Fee for this degree, £11.

Master in Obstetric Science.—The candidate must be a B.A.O. of two years' standing, and must produce satisfactory evidence of having been engaged in the study of obstetrics for two years. He is then required to pass an examination in the following subjects:—Practice of midwifery, gynaecology, anatomy of female pelvis, and elementary embryology and clinical gynaecology. Fee for this degree, £15.

Diploma in Gynaecology and Obstetrics.—The candidate need not be a graduate in Arts, but must have been a registered practitioner for at least twelve months and have spent at least one year after registration in the study of obstetrics and gynaecology. During this year's course he must have been resident for six months in Trinity College and for six months in the Rotunda Hospital.

Diploma in Public Health.—The candidate must be a registered medical practitioner; must have completed, subsequent to obtaining a registrable qualification, four months' practical instruction in a laboratory in practical work in

chemistry and bacteriology applied to public health; he must have studied, practically, outdoor sanitary work for six months under an approved officer of health; and have attended, after qualification, for three months the practice of a hospital for infectious diseases.

Degrees in Dental Science.—Candidates for the B.Dent.Sc. degree must have taken a degree of Arts and must have had their names in the books of the Medical School for four years. Three examinations must be passed—namely, the Preliminary Scientific at the end of the first year; the Intermediate at the end of the third year; and the Final Dental at the end of the fourth year. The total fees are £309 4s. Candidates for the degree of Master in Dental Science must be Bachelors in Dental Science of at least one year's standing. They will be required to pass an examination in Pathology and Bacteriology, and either to carry out Dental work of an advanced character to the satisfaction of the examiners, or to present a thesis, to be approved of by them, giving evidence of original research on some subject connected with dentistry.

The fee for the M.Dent.Sc. examination is £5, and the fee for the degree is £10.

Full particulars regarding the Medical and Dental Courses and a prospectus of the Courses for the Diploma in Public Health may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.

The National University of Ireland confers the degrees of M.B., B.Ch., and B.A.O. on students who have followed the prescribed course for five academic years, and passed the prescribed examinations. At least three years must be spent at one of the constituent colleges of the University—namely, the University Colleges of Dublin, Cork, and Galway. The University also confers the degrees of M.D., M.Ch., M.A.O., B.Sc. (Public Health), D.Sc. (Public Health), B.D.S., Primary degrees, and M.D.S.

The expense of obtaining the degrees of M.B., B.Ch., and B.A.O., in University College, Dublin, is approximately—Lectures, £91; Hospitals, £54 14s.; University fees, £21; total, £169.

The conditions for the higher degrees are:—

Doctor in Medicine.—Candidates may present themselves for the examination for this degree after an interval of three academic years from the time of obtaining the M.B., B.Ch., B.A.O. degrees; but in the case of candidates who have obtained a degree of the University in the Faculty of Arts, or the Faculty of Science, an interval of two academical years is sufficient.

Candidates must at the same time produce a certificate of having been, for at least, two academical years, engaged in hospital or private medical, surgical, or obstetrical practice respectively, or in the military or naval medical service.

Candidates at this examination must answer in Medicine and Pathology.

Master in Surgery.—The following are the subjects of examination:—

Surgery, theoretical and practical, including Ophthalmology and Otology; Surgical Pathology; Surgical Anatomy and Operative Surgery, with the use of Surgical Instruments and Appliances. The other conditions are the same for the M.D. degree.

Master in Obstetrics.—Academic standing is as for the two previous degrees. Each candidate must furnish satisfactory evidence that since he has (1) had personal charge of at least *twenty* cases of labour; and (2) attended during a period of three months the practice of a clinical hospital for diseases of women where at least six beds are in constant occupation or in a special ward of a general hospital, where such cases only are treated, and containing at least six beds in constant occupation.

Candidates at this examination must answer in the following subjects: Midwifery, Diseases of Women and Children, Pathology, the Use of Instruments and Appliances. Fee for each of the above degrees is £10 10s. In the case of graduates who have matriculated in the Royal University the fee is £5.

Bachelor of Science, Public Health.—A candidate shall not be admitted to receive the degree unless he—(a) shall have received the degrees of M.B., B.Ch., and B.A.O., at least one year previously; (b) shall have pursued an

approved course of study in the Faculty of Medicine; and (c) shall have passed the prescribed examination. Fee, £7 10s.

Courses.—In addition to D.P.H. Course; (1) Special Pathology (three months); (2) Bacteriology second course (three months); (3) Advanced Course in Hygiene (three months).

Doctor of Science, Public Health.—The regulations are not yet published. Fee, £10 10s.

Diploma in Public Health.—This Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed courses of study, approved for the purpose, and shall have passed the prescribed examinations; provided that it shall not be granted except to a registered medical practitioner.

The conditions and examinations are similar to those already quoted for the University of Dublin.

Degrees in Dentistry.—Candidates for the degree of B.D.S. shall be required to pass, after matriculation, four University Examinations—namely: A first University Examination; a Second University Examination as for Medical Students; a Third University Examination in Dental Surgery; a Final Examination for the degree of B.D.S.. University Fees, £16 10s.

Master of Dental Surgery.—Candidates may present themselves for the examination for this degree after an interval of three academic years from the time of obtaining the B.D.S. degree. Fee, £10 10s.

The University also grants Diplomas in Mental Diseases and Tropical Medicine.

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

Royal College of Physicians of Ireland.

This College issues a Licence in Medicine and a Licence in Midwifery to registered medical practitioners.

Licence in Medicine.—The subjects of examination are—Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene and Therapeutics.

Licence in Midwifery.—The subjects of examination are—Gynæcology and Midwifery.

Fees.—Fee for the Licence to Practice Medicine, £15 15s. Fee for the Licence to Practice Midwifery, £5 5s.

Membership.—The Membership is open to University Graduates in Medicine and to Licentiates of the Royal Colleges of Physicians of the United Kingdom. The Examinations for Membership are held in February, June and November, and such other times as the President may appoint. Fee to Licentiates of the College, £21; to others, £36 15s. Special Examinations £10 10s. extra.

Fellowship.—The Fellowship is open to all Members of the College of one year's standing or over, irrespective of sex. Fee £60. Election is by ballot.

Royal Colleges of Physicians and Surgeons.

Examinations are held conjointly by the two Colleges. The course, as in other bodies, extends over five years, with examinations at the end of the first, second, third and final years. As in the English Colleges, the subjects of the First Professional Examination may be studied either at a medical school or at an institution other than a medical school, which is recognised by the Colleges, after due inspection for instruction in these subjects. We recommend students to apply for the official programme to the Secretary of the Committee of Management, Royal College of Surgeons, or to the Registrar of either College. In the case of the Preliminary Examination seven clear days' notice must be given to the Secretary.

The Colleges also confer a Diploma in Public Health.

Royal College of Surgeons in Ireland.

This College grants a Licence in Surgery to registered medical practitioners.

The subjects, methods, times and places of examination are those of the surgical group of the Final Professional Examination of the Conjoint Board in Ireland of the Royal College of Physicians and the Royal College of Surgeons. Special examinations will not be granted under any circumstances.

The fee for examination for each admission is five guineas.

The fee to be paid upon admission to the Licence in Surgery is twenty-five guineas.

Fees will not be returned under any circumstances.

Fellowship.—The examination for the fellowship is divided into two parts—namely, the Primary and the Final. The subjects of the primary examination are anatomy, including Dissections, Physiology and Histology. The subjects of the final examination are Surgery, including Surgical Anatomy and Pathology. Candidates must pass in all the subjects at one examination. The examinations are held three times in each year.

Fees.—The fees for examination are as follows:—(1) Primary examination, each admission, 5 guineas; final examination, each admission, 5 guineas. (2) Of these examination fees ten guineas will be reckoned as part of the fee payable upon admission to the Fellowship. (3) The fee to be paid upon admission to the Fellowship is forty guineas, except when the candidate is a Licentiate of the College, in which case the fee is twenty-five guineas.

Licence in Dental Surgery.—Candidates for the licence in Dental Surgery are required to pass two professional examinations. They must have passed a recognised Preliminary Examination in general education, have been registered as medical or dental students by the General Medical Council, and have been engaged for two years in acquiring a practical familiarity with the details of mechanical dentistry under the instruction of a registered dentist, or under the direction of the superintendent of the mechanical department of a recognised dental hospital where the arrangements for teaching mechanical dentistry are satisfactory to the Council of the College. This instruction may be commenced or attended before the candidates register as medical or dental students. One year's *bona fide* apprenticeship with a registered dental practitioner, after being registered as a medical or dental student, may be counted as one of the four years of professional study required. There are special exemptions in the case of persons already holding a surgical or dental qualification.

Apothecaries' Hall of Ireland.

The Licence of this Hall is granted to students who present certificates of having completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diplomas of the Apothecaries' Hall of Ireland entitle the holder to be registered as a practitioner in medicine, surgery, and midwifery, and possess the privileges of an apothecary.

There are three professional examinations, the total fees for which amount to 40 guineas. Women are eligible for the diploma.

Registered medical practitioners receive a diploma of the Hall upon passing an examination in the subject or subjects not covered by their previous qualification, and on paying a fee of £26 5s. (twenty-five guineas).

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21.

Each candidate must produce evidence of having before entering on medical studies passed a preliminary examination in general education.

The details of the course of education required and syllabus of the examinations will be supplied on application to the Registrar at 40 Mary Street, Dublin.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

Menstruation and Its Disorders. By EMIL NOVAK, A.B., M.D., F.A.C.S., Instructor in Clinical Gynæcology, John Hopkins' University, etc. Roy. 8vo. Pp. 357+XV. D. Appleton and Co.

THIS is one of the most valuable contributions to gynæcological science which has appeared for some time, and contains a vast amount of extraordinarily useful knowledge. We regret to say that with all the investigations pursued by the author as exposed in his monograph of upwards of 360 pages the cause of menstruation is not yet discovered, and we must still accept the dictum enunciated by Columbat that the mystery of menstruation will be for ever "covered with a veil which cannot be perfectly removed."

Novak is a disciple of Hitschmann and Adler, but is broad in his views and remarks that even already Henkel, Keller, Schroder and others have found discrepancies, although the weight of evidence is in accordance with the general correctness of their (Hitschmann and Adler's) teaching; but there is still room for discussion in certain details. One of the most vivid facts enunciated is the comparison of the cycle of menstruation with that of the corpus luteum and the chronological relation is clearly shown. Menstruation is divided into four stages—Postmenstrual, Interval, Premenstrual and Menstrual, and these correspond in the corpus luteum with the stages of (1) proliferation which lasts from the first to the fourteenth day during which ovulation occurs (probably about the fifth); (2) vascularisation; (3) maturity, and (4) retrogression which corresponds with the onset of menstruation. It is interesting to observe that the failure of early investigators to describe the life history of the corpus luteum was due largely to neglect of the thin-walled structures often without bloody contents which represent the very early stages of the corpus luteum. The present status of the question as to the origin of the lutein cells is still *sub judice*, but the theory of epithelial origin from the cells of the ganulosa is fairly well established. The results

of Czyzewicz as to whether the Fallopian tubes take part in menstruation are negative in that, although blood may be found in the tubes during menstruation it has never been seen to leave the vessels by those experimentalists who have adopted a rigorous technique.

The clinical section of the work is at a high level, but does and could not show the amount of work which has been expended on the more scientific sections. There is a useful note on endocrines and a chapter by Kelly and Burnham on x-ray therapy.

The bibliography alone makes the work a necessary addition to the library of the gynæcologist, and it is produced well with excellent type and paper.

ARTHUR GILMOUR.

The Essentials of Dermatology. By WALTER JAMES HIGHMAN, M.D. Macmillan Co., N.Y. 1921. Pp. xvii. + 482. 32/-.

IN this book the author makes a bold and not unsuccessful attempt to analyse within a short space the views of the two great schools of Dermatology—the German and the French. He endeavours to find a common ground between the two in the classification of skin diseases, but recognises the sharp distinction that until recently separated both. The one “attempting to restrict all dermatoses to the skin alone, the other (the French) regarding most skin affections as of internal causation.”

This is a difficult problem to deal with in four hundred pages when we consider the amount of matter dealt with in the monumental works of such authorities as Brocq, Darier, Sabouraud, Hebra and Unna. For that reason while original and useful the book is disappointing in some ways, being neither a standard work to the extent of Stelwagon (the histology is poor) nor is it anything more original in etiology or treatment than the average standard text-book on the subject.

The author divides skin diseases into autochthonous and non-autochthonous. He then devotes a chapter to a short summary of cutaneous lesions which is not very illuminating, and there is also a short note on methods of examina-

tion and diagnostic procedure which is too sketchy to be of much practical value.

Great attention is paid to classification and nomenclature—to the latter especially. In the attempt to make them original the result is often confusing, especially when dealing with eczema and the epidermal dystrophies.

The symptomatology is sound and useful. The chapter on drug eruptions very good. The treatment of some diseases such as Raynaud and acne vulgaris is very poor. The chapter on eczema is long, original solely in respect of classification, and rather confusing. There is an excellent chapter on syphilis in all its aspects.

To sum up. The work as a text-book is original in classification, very good in symptomatology, very average in treatment and poor in histology. It is illustrated by 95 photoplates unusually clear and instructive.

M. DRUMMOND.

The Treatment of Diseases of the Skin. By W. KNOWSLEY SIBLEY, M.D., M.R.C.S.Eng. 3rd Edition. Ed. Arnold, London. 1920. Pp. 248. 12/6.

THE third edition of this book, while bringing a recognised standard work on Dermatology more up to date, is a valuable addition to the more recent publications on the subject.

The matter of the book is too well known in previous editions to require detailed criticism. Part I. deals with special methods of treatment. Part II. with a short summary of the better known skin diseases, their general and local treatment. Part III. gives a number of useful prescriptions, dyes, etc. The special and general methods of treatment will be found most useful and reliable. The chapter on *x-ray* therapy is admirable, its uses and doses being clearly set forth. This form of treatment in relation to ringworm is thoroughly dealt with in the chapter on that subject.

The special chapters on Ionic medication, Carbon Di-oxide snow and Radium are all helpful, explaining clearly the latest methods of applying these forms of treatment. The chapter on Vaccines is good, but open to criticism, especially as to the value of the acne bacillus in the vaccine treatment of that disease.

In Part II. individual diseases, the local treatment of ringworm is admirably dealt with, Dr. Sibley explaining the methods of applying the various drugs employed with great clearness. The chapters on Eczema and Psoriasis are equally good. There is an excellent chapter on medicinal baths.

Twenty-four very good and clear plates complete what should prove for treatment and reference a most useful book for both the dermatologist and the general practitioner.

M. DRUMMOND.

A Handbook of Skin Diseases and Their Treatment. By ARTHUR WHITFIELD, M.D. (Lond.), F.R.C.P. Second Revised Edition. Ed. Arnold. London. 1921. Pp. xii. + 291. 18/-.

THE revised edition of this work adds considerably to a very useful reference book. Few changes will be noted in the classification and etiology or symptoms of the well-recognised diseases with which the book deals, compared with the previous editions. In general the symptomatology will be found more satisfactory than the etiology, although the author deals lucidly with the modern theory of focal infection.

It is in the general treatment of skin diseases that the book will be found most valuable. In this the book has been thoroughly revised and brought up to date. In dealing with general treatment the author confines himself as far as possible to the use of a few drugs for both internal and external use and lays stress solely on those which he can personally claim to have found successful. This is helpful as one is not left with a long list of drugs which various authorities are said to recommend. In erysipelas, for instance, the author confines himself to liq. ferri perchlor (20 to 60 minims every four hours) and the painting of the part with 25 to 50 per cent. solution of ichthyol in water which he claims to be almost a specific. In the local treatment of ringworm of the scalp croton oil is the author's chosen drug, and the methods of application are most clearly dealt with. Colloidal manganese is strongly recommended in the treatment of boils if a vaccine cannot be given or a second course seems to be required. In the treatment of

sycosis the fact that the disease is most rebellious to treatment when well established, is clearly recognised, and the importance of *x*-rays emphasised.

X-ray treatment is excellently described even in technique, especially Adamson's method for *tinea tonsurans*. The author rightly and courageously gives a warning that the pastilles used should be supplied by Drault of Paris because of the danger of forgeries or imitations, of which he himself had experience. It is a warning that cannot too often be repeated. Eczema is well dealt with, but the local treatment presents no remarkable features. The chapter on alopecia should be helpful. One of the best features of the book is the chapter on syphilis. It includes methods of diagnosis and a complete and excellent summary of the use of the Wassermann reaction in all its aspects and in all its relations to the disease. All forms of treatment are dealt with, and that by the arsenobenzol compound in detail.

In many diseases the author draws where possible on experience gained in the War. Thirty-six excellent illustrations complete the book. Many are from the microscope and a number of half-tone plates form an unusual and admirable feature of an accurate and helpful text-book.

M. DRUMMOND.

Blood Pictures. By CECIL PRICE JONES, M.B. Second Edition: John Wright and Sons, Bristol. 6/6. Pp. 64. THIS book, dealing in a small space with blood-work—and blood-work only—is consequently convenient. The author applies the term “blood picture” to the results obtained by a complete blood examination, not to the mere observation of stained films. The results are striking, and the amount of clinical differentiation which can be made by such means appears to be very large—particularly as regards the differential leucocyte count. It is with pleasure that we observe our author to emphasise the fact that too much importance should not be attached to such observations; that they should only be regarded as factors in the diagnosis. Such a warning, in our opinion, is timely. Many clinicians are, we think, too readily swayed by laboratory findings, and an amount of responsibility in diagnosis is being fas-

tened upon the clinical pathologist which he is not competent to bear. Modern diagnosis is tending to become a sum in addition and subtraction of observation; well and good—but the clinical factors are figures of higher value than the hæmatological and other fractions.

J. H. P.

Practical Bacteriology: Blood-Work: Parasitology. By E. R. STITT. Sixth Edition. H. K. Lewis. 1921. Pp. xii. + 633 20/-.

THIS marvellous little volume is by an American. Marvellous in its enormous scope—its simplicity—its sense of proportion—its entire absence of pontificating dogma. As regards general clinical pathology, were we to be allowed to retain only one book—we are not sure that we would not decide upon Stitt—Emery's *Clinical Bacteriology and Hæmatology* being the only other book of a similar value we can recall at the moment. A feature of the work is the author's condescension to the requirements of those whose work is in small quantity or intermittent upon any particular field.

J. H. P.

A Text-book of General Pathology. By BEATTIE and DICKSON. Second Edition. Heinemann. Pp. 496 + xlv. 31/6 net.

THIS volume, with its companion upon Special Pathology, upon its first appearance under Rebman, became the favourite student manual. We confess that in our opinion the second edition falls short considerably of the first as regards the uncoloured illustrations. Both editions are before us and the blurring and softening of outline, to whatever cause it may be due, is very marked. The coloured plates are enhanced by the addition of Dr. James Dawson's illustrations from his thesis upon Inflammation, and are of much beauty and delicate precision. As regards the text the principal modification consists in the addition of a chapter upon Fever. The book is likely to remain popular amongst students, most of the more recent works upon Pathology possessing a certain philosophic breadth of treatment, rendering them more suitable for the qualified practitioner.

J. H. P.

The Stomach and Abdomen, from the Physician's Stand-point. By WILLIAM RUSSELL, M.D., LL.D., Ex-President Royal College of Physicians, Edinburgh; Professor, Emeritus of Clinical Medicine, Edinburgh University; Consulting Physician, Royal Infirmary, Edinburgh. London: Bailliere, Tindall and Cox, 8 Henrietta Street, Covent Garden. 1921.

THIS book may be regarded as a series of first-class clinical lectures on the diagnosis and treatment of abdominal complaints, as viewed primarily by a physician. It does not contain anything very new, but, nevertheless, it is instructive and decidedly practical. The author realises that diagnosis is all-important, and in consequence almost every condition is tackled from the differential diagnosis point of view. We are glad to find that the existence of definite functional gastric disturbances is insisted on, and although not quite as all-embracing as the writer appears to think, nevertheless, the distinction into two main types of functional import—hypo and hyperchlorhydria—is, at any rate, convenient and in accordance with much of our knowledge. As one reads through the book one naturally finds here and there various observations and bits of advice with which one does not agree. For example, one can hardly believe that congenital pyloric stenosis is as common in the adult as the chapter on the subject would have one believe. Again, it is impossible to agree that once pyloric narrowing of non-malignant type is diagnosed, anything but surgical treatment should be advocated. Toward the end of the book an article on perirenal suppuration ends up with a series of statements which tell one that the diagnosis is always easy, and apparently even obvious. Some cases are indeed easy to diagnose, but very many constitute in the earlier stages of development some of the most difficult problems in abdominal diagnosis. However, it is all the better that one should not always agree. We recommend the book as one which is thoughtful and pleasantly stimulating.

ABSTRACTS OF CURRENT LITERATURE.

ANÆSTHETICS.

GWATHMEY, J. T. : *Current Progress in the Science and Practice of Anæsthesia.* "Journal of the American Medical Association." August 6, 1921.

STATISTICS compiled by the Committee on Anæsthesia of the American Medical Association for the years 1905 to 1912, in which are recorded over half a million administrations, show that sequences and combinations of anæsthetics are safer and better from every standpoint than any one agent used alone. The mortality with straight ether, according to this table, is one death in 4,533 cases; with sequences the mortality of ether is, in one sequence reduced to one death in 6,424 cases, and with another sequence to one death in 10,007 cases. When oxygen is used instead of air with any general inhalation anæsthetic, it adds to the immediate safety of the patient as well as to his subsequent comfort. The same can be said when any one of the agents employed is heated to the temperature of the body. The addition of oxygen to nitrous oxide not only renders the patient's condition more comfortable, but it also increases his safety to such an extent that no administrator would be held blameless if he did not use this precaution. With the addition of oxygen and warmth to the nitrous oxide, administration may be prolonged, under certain conditions, without lowered blood pressure, either during or after operation, but the relaxation required for certain operations must then be obtained by other agents.

The administration of nitrous oxide and oxygen without the addition of other agents is often positively dangerous, and the mortality is high. The statistics of nitrous oxide are misleading. It is the most expensive form of anæsthesia, and probably over 90 per cent. of the patients on whom it is used are private cases, and thus the deaths occurring under it are not recorded in the hospital statistics. Unquestionably, a patient's condition is better after the administration of nitrous oxide, and oxygen with small amounts of ether (from 1 to 4 drams) than when saturated with ether. The smaller the amount of ether used, the less the resulting nausea, vomiting and fall in blood pressure.

Can we abolish the use of ether with nitrous oxide and oxygen, and get the same resultant relaxation? Yes. By using the synergistic action of magnesium sulphate with morphine as a preliminary, we obtain a safer form of anæsthesia with equally good

relaxation, and with less nausea, vomiting, and depression afterwards. Ether is thus eliminated and increased anæsthetic efficiency is obtained. Magnesium sulphate with morphine synergises the nitrous oxide and ether, and if used with ether it will reduce the amount required by from one-third to one-half, with no decrease in efficiency. Magnesium sulphate has no deleterious effect on any of the tissues of the body, and when used as a synergist it has no toxic effect on the respiratory centre. It seems to act mechanically with morphine holding the drug in contact with the tissues longer than it is able to maintain such contact alone; but with ether and also with nitrous oxide and oxygen, it acts by deepening or increasing the effect rather than by prolonging it.

Hence the same amount of morphine may be used with magnesium sulphate as with sterile water. For instance $\frac{1}{8}$ grain of morphine in 1 or 2 c.cs. of a 25 per cent. solution of chemically pure magnesium sulphate is increased in value from 50 to 100 per cent. as compared with the same amount of morphine used in sterile water. One hypodermic of this mixture will relieve pain for from ten to thirty hours, as compared with two to four hours with sterile water. When magnesium sulphate is used with ether, the latter may be cut one-third to one-half in amount. When it is used with nitrous oxide and oxygen, the oxygen may be increased and the nitrous oxide decreased. The results are constant and the technique simple. An hour and a half before operation a hypodermoclysis is given aseptically of from 200 to 400 c.cs. of a sterile and chemically pure 4 per cent. solution of magnesium sulphate, at a temperature of 110° F. the solution running in by gravity in not less than thirty minutes. An hour and fifteen minutes before operation the first hypodermic of $\frac{1}{8}$ grain of morphine in water or in magnesium sulphate is given. This is repeated at intervals of fifteen or twenty minutes until three-eighths grain is given to a healthy adult. Quite often one-fourth grain is sufficient. The room should be darkened, quiet maintained, the bed screened, and a towel placed over the patient's face. When ready, the patient should be lifted gently and quickly, and wheeled to the theatre. The mask is applied to the face and oxygen administration is started at the same time as nitrous oxide. Cyanosis should not be tolerated as the gases are used only to complete the analgesia, and to render the patient unconscious. Oxygen may be rapidly increased up to 35 per cent., or even 50 per cent., as the patient will be found fully relaxed, and pushing the nitrous oxide will merely add to the danger without increasing the efficiency. A continuous administration is the most satisfactory. With magnesium sulphate, morphine and nitrous oxide and oxygen, we can maintain a state of general analgesia with relaxation almost indefinitely without deleterious effects.

SURGERY.

MACLENNAN: *Radical Cure of Femoral Hernia in Children.*
 "Glasgow M. J." August, 1921, p. 83.

THE author has successfully used a special bone staple, on the Roux principle, in combination with the McEwen procedure of employing the sac as a cork for the ring. A vertical incision is made over the site of the ring, the sac isolated, and freed back to the ring, its neck freed from the canal; after ligation of the sac, the stump is fixed to the inner and under Poupart surface, after which the pubic ramus is exposed and stripped of periosteum, to which bared area the inner extremity of Poupart's ligament is fixed by means of the staple. In 6 cases this method was employed; in 2 of the cases Poupart's ligament was sutured to the psoas sheath besides being fixed by staple. There were no recurrences.

WM. DOOLIN.

BRAMWELL AND DYKES: *Rib Pressure and the Brachial Plexus.*
 "Edin. Med. Jour." August, 1921, pp. 65-88.

THE authors class lesions of the brachial plexus due to rib pressure into two groups: (a) cases where a group of pressure symptoms is demonstrably due to a cervical rib or to a rudimentary first rib; (b) cases where the same group of symptoms is unaccompanied by any evidence of rib anomaly, the symptoms being due to pressure by a normal first rib.

PRESSURE symptoms are observed in only a small proportion of cases with cervical ribs (5-10 per cent. Borchardt). Though there is no evidence to show that cervical ribs are more common in the female than the male sex, yet pressure symptoms are far more commonly met with in women. The authors are attracted by Wingate Todd's contention that this is attributable to the pronounced drooping of the shoulder girdle in women taking place in early adult life. In 70 per cent. of the recorded cases, cervical ribs are bilateral, yet pressure symptoms as a rule are unilateral; it is exceptional to find symptoms when the anomalous rib is unusually prominent (Lewis Jones).

Clinically, four types may be distinguished according to their predominant symptoms: (1) cases characterised by motor, sensory, and vasomotor disturbances; (2) pain, without objective sensory or motor disturbance; (3) muscular weakness and wasting, without pain or other sensory phenomenon; and, rarely, cases where we find, (4) vasomotor disturbance alone, or (5) acroparaesthesia, apparently produced by rib pressure.

Diagnosis can and must in many cases be arrived at from the

character of the pressure symptoms alone, for corroborative evidence is by no means always afforded by an *x-ray* examination. The angle at which the photograph is taken is of importance.

When pain is so severe as to cause constant annoyance, or when muscular wasting is producing interference with occupation, surgical intervention is indicated. Pain is usually completely relieved by operation. Paralysis may be completely cured, or greatly relieved; with pronounced wasting of the hand muscles, however, complete recovery cannot be expected. Ill effects may occasionally occur in inexperienced hands (*e.g.*, opening of pleura, bruising of plexus, injury to individual branches, etc.). Notwithstanding, the risks of operation in the hands of an experienced operator are comparatively small whilst the results of operative treatment are often brilliant.

WM. DOOLIN.

W. W. BABCOCK (Philadelphia): *Morbidity after Abdominal Operations*. "Med. Record." August 20, 1921, p. 319.

FAILURE of an abdominal operation to relieve a patient's symptoms may be due to one of the following circumstances:—(1) The cause of the symptoms was extra abdominal, and the operation a mistake (*e.g.*, operations for appendicitis, where symptoms were of pleural or pneumonic origin; mistaken diagnosis of gastric symptoms due to pulmonary tuberculosis, myocardial, or aortic lesions; uterine fixations for backache due to spinal conditions, etc.).

(2) An intra-abdominal lesion, though present, is unrecognised, and the wrong operation performed (*e.g.*, unnecessary appendicectomies and gastro-enterostomies, with the main pathology in gall-bladder or ascending colon).

(3) The operation was a technical failure, because either it failed to do what was intended, or added a new pathological condition with new symptoms, or aggravation of old ones. ("We must turn from pathology-producing operations to a more earnest attempt to restore physiological function in our surgical treatment.")

WM. DOOLIN.

EMIE NOVAK (Baltimore): *Acute Dilatation of Stomach*. "Jour. Am. Med. Association." Vol. 77. No. 2. July, 1921.

N. points out the importance and danger of this not infrequent complication following upon operation. Successful treatment depends upon early and accurate recognition; and, in his opinion, the use of the stomach tube is the most important means of diagnosis. It is of the utmost importance to differentiate the condition from peritonitis and from ileus, always bearing in mind the fact that a dilated stomach is a frequent accompaniment of severe peritonitis.

In discussing the etiology, N. quotes much evidence tending to discountenance the theory of arterio-mesenteric occlusion: the evidence at our disposal points rather to a gastric paralysis as being the immediate cause of the dilatation.

Therapeutically, operative measures are unjustifiable; gastric lavage and the Schnitzler posture, commenced early, are the correct measures to be adopted.

WM. DOOLIN.

W. SAMPSON HANDLEY: *Progress in the Surgery of Breast Cancer*
"Brit. Med. Jour." 1921. 3132. pp. 37-43.

- H. lays down the following principles underlying his technique.
1. The primary tumour should always form the centre of the field of operation, seeing that the cancerous growth spreads centrifugally.
 2. A circular zone of skin, 4" to 5" in diameter, whose centre is the tumour, should be removed. Contrary to the opinion held formerly, the skin is not invaded as a sheet, but is infiltrated at various isolated places from the depth lymphatics, from below upwards.
 3. The deeper cellular tissues containing these lymphatics should be removed around the tumour in a zone whose diameter is not less than 10 inches. This fascial dissection needs particular care in the epigastric area, to avoid direct infiltration of the subperitoneal lymphatics.

By carrying out this technique, plus a meticulous clearance of the axilla, one sees but few cases of recurrence in axillary glands, scar, or neighbouring skin, particularly if postoperative irradiation has been employed.

Handley operates on practically all cases, to avoid the annoyance of a later ulcerating tumour. He claims 48 per cent. free from metastases at the end of a 3 year period. The most frequent site of "recurrence" following his technique is in the supraclavicular and intercostal spaces.

The intercostal recurrence is manifested by the appearance at the inner extremity of the space of one or more small nodules, adherent to the muscle, but not adhering to the skin till much later. Other nodular enlargements appear later, spreading out to the mid-axillary line. This type of metastasis signifies a cancerous invasion of the anterior mediastinal glands at the time of operation. He has 6 times added to his primary operative procedure an exploration of the mediastinum, but owing to the gravity of this step, and its disappointing results, has abandoned this procedure.

Supraclavicular recurrence is more frequent, usually showing first beneath the posterior belly of the omohyoid, and in the angle between the clavicle and the posterior border of the sternomastoid. Handley no longer explores the supraclavicular fossa at the primary

operation ; when recurrence appears here, he makes a complete block dissection of this triangle, provided the glands are mobile : fixity of these glands signifies an invasion of the pleural dome, and is a contraindication to operation. Even with later recurrence again in this area, the operation will not have been purposeless, for it will have caused relief to either compression or actual invasion of the brachial plexus by the cancer growth, with the terrible neuralgia which ensues.

X-rays and radium are of use as adjuvant treatment ; used without operation they are of no practical utility,—except in inoperable cases. A shrinkage in the tumour after exposure to x-rays at times signifies nothing else than the acceleration of the normal process of destruction which one often observes in the central parts of a cancerous growth, while the peripheral cells remain fully active. Pre-operative x-ray exposure can be beneficial, but should not delay operation. It is possible that moderate doses of the x-ray render the patient more resistant to cancer infection during operation. After operation, Handley advises a short series of exposures, followed, after an interval, by a second series. Whilst the action of the x-ray is a surface one (and therefore of prophylactic value in the case of superficial nodular recurrences) the action of radium is more intensive, and should be employed in cases of circumscribed recurrences. For some time past, Handley has been using radium prophylaxis during the course of the primary operation ; a radium tube is introduced into the inner extremity of each of the upper three intercostal spaces, the threads passing out at the angle of the incision ; a fourth tube is introduced into the supraclavicular triangle through a stab incision ; these are left in situ for 24 hours after operation. Similarly, following on secondary clearance of the supraclavicular lymphatic area, a tube of radium is left in the wound.

Finally, the author emphasizes the value of an open air life in keeping down recurrences. Many of Handley's patients show long periods of survival (in one case, up to 8 years) after a secondary operation for supraclavicular or intercostal recurrence, when operation has been accompanied by radium treatment.

WM. DOOLIN.

LENTHAL CHEATLE: *Benign and Malignant Changes in the Duct Epithelium of the Breast*. "Brit. Jour. Surg." Vol. viii. 1920-21. pp. 149-166 and 285-306.)

FIFTEEN years ago, Cheatle tentatively suggested ("B. M. J.," May, 1906) that cancer begins most commonly in the ducts of the breast rather than in the acini. Subsequent experience has but added evidence largely supporting his original views. In May, 1914, in a communication to the Roy. Soc. Med., London, he showed that cancer may arise in cysts which are of duct origin.

In these two papers, he elaborates his concept along the same lines; demonstrating (1) that breasts which are clinically described as "cystic" are dangerous; (2) that dangerous cysts are of duct origin; and (3) the cystic origin of cancer leads to microscopical appearances which are diagnostic in character.

Duct openings should be protected from the entry of irritant substances. Duct cysts must not be regarded as separate cysts, since they are parts in continuity of dilated and convoluted ducts; in these there may be great variation, numerically, of benign papillomata. As regards primary duct cancer, C.'s views shortly are as follows:—The primary transformation of the epithelial cells into malignant cells may take place over a wide extent of the canalicular surface; cancer cells originating at one part of the duct may reach other parts of that duct or other ducts, thus forming metastases in addition to the more usual process of infiltration.

A solitary solid tumour not puckering the skin may be a duct adenoma or carcinoma; glands in the axilla, coupled with nipple discharge, confirm the latter diagnosis. The malignancy of this type varies enormously.

He suggests that biochemical investigation of the autolytic products of injured epithelial cells may determine for us the irritant which is capable of producing cell multiplication, ordered or disordered. The analogy with cell growth induction in tarworkers is drawn attention to.

WM. DOOLIN.

LEWIS, J. H.: *The Route and Rate of Absorption of Subcutaneously Injected Serum, in Relation to the Occurrence of Sudden Death after Injection of Antitoxic Horse Serum.* "Journal of American Medical Association." May 14, 1921.

MOST of the cases of sudden death from anaphylaxis in man have followed subcutaneous injections, and usually the onset of symptoms and often the fatal termination occurred a few minutes after the injection. However, the normal rate of absorption of serum from the subcutaneous tissues is slow. How are these facts to be reconciled?

Lewis performed a series of experiments in investigating the problem. A dog was anæsthetised and injected subcutaneously with horse serum. Samples of lymph from a cannula in the thoracic duct, and of blood from a leg vein were taken at intervals after the injection, and were examined for horse serum by means of the complement fixation test. It was found that the first trace of horse serum appeared in the lymph 40 minutes after the injection, and in the blood 3½ hours after injection.

Another experiment was performed. Sensitised guinea pigs were injected subcutaneously with horse serum. When the site of

injection was vigorously massaged the guinea pigs were much more severely and more rapidly affected than when this was not done. Lewis concludes that the massage forced the serum into the circulation through the lymphatics, and that this resulted in its more rapid absorption. He concludes that "because of the suddenness with which it appears, and because of the analogy to the occurrence of fat emboli after the subcutaneous injection of oily substances, acute anaphylactic death in man following subcutaneous injections of horse serum is probably due to an accidental intravenous injection of the serum." Great care should be taken to avoid injury to a blood vessel during subcutaneous injection of horse serum.

V. M. SYNGE.

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Original Communications.

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I.

MENSTRUATION AND OVULATION.

By PROFESSOR DR. OSKAR FRANKL, Vienna.

MR. CHAIRMAN, Members of the Royal Academy of Medicine, Ladies and Gentlemen,

I wish to thank you most heartily for your cordial invitation to deliver three lectures before you. I begin my address with two different feelings. The first is a feeling of hesitancy, whether I will succeed to arouse your interest and whether I will be able to tell you anything that has not been familiar to you this long time. The second feeling is that of pride and pleasure that you have invited me, a son of the poorest country in the world—namely, Austria. I shall be able to show you that in spite of our poverty we are not at a stand-still in the field of science, but that we intend to continue our researches until the foreign countries will again grant us the friendship and appreciation which we enjoyed in such a full measure before the war. It will be my ambition not only to serve science, but it will also be my great endeavour to regain old and to win new friends for our poor fatherland. It is for this that I have willingly absented myself from my work in Vienna. I consider it a very great honour to be allowed to speak before this old and honourable Royal Academy of Medicine, and I shall

make the attempt to the best of my ability to bring before you the three papers which I have prepared for this occasion.

The inter-relationship between menstruation and ovulation is of the highest importance not only to the gynæcologist, but to every practitioner who is concerned with the treatment of diseases of women. Menstruation plays an important rôle in various ways in their physiological and pathological economy. It is therefore of fundamental importance that we should have a clear idea of the phenomena of the expulsion of the ovum and of menstrual bleeding.

But the question is of much wider interest. For we know to-day that menstruation and ovulation are in mutual relationship to one another, and also that these two functions are closely associated with the functioning of other organs, especially the various ductless glands. Therefore if we wish to investigate thoroughly the question of the processes of menstruation and ovulation, it is necessary to study the most important relations between the genital organs and the glands of internal secretion.

The functions of the female genital organs can continue regularly and satisfactorily only if the balance between the different ductless glands (including certain parts of the ovary, which we know produce hormones) is maintained. The disappearance or the hyperfunction of a gland immediately produces a disturbance in the physiological balance of the female economy, which has been called "dyshormonia." This effect might be compared to the constituent parts of an orchestra which are not tuned properly (Seitz). The instruments are the ductless glands and the harmonious melody produced the general well-being of the body. Faulty playing on the part of one performer produces a discordant effect on the *tout ensemble*—the whole melody is adversely affected. We have here in short a dyshormonia.

In this connection the hypophysis, in my opinion, plays a most important part. We know that the anterior lobe of the hypophysis is an endocrine gland and secretes a hormone whose chemical composition has as yet not been very well defined. The posterior lobe consists for the most part of nerve tissue, but is surrounded also by a thin layer of epithelial tissue, which also secretes a hormone. The

chemical constituents of this latter secretion are a little better known; it is a derivative of *Imidazole*.

The investigations of Cushing and Aschner have shown that extirpation of the anterior lobe in young animals causes a stagnation of the general development of the body, and particularly of the genital organs, whilst animals fed on a diet containing anterior lobes substance develop and grow rapidly, and their genital organs are quickly and intensively developed. On the other hand we know that during pregnancy (Erdheim and Stumme) and after castration (Tandler and Gross) the hypophysis tends to somewhat hypertrophy.

During pregnancy the essential cells show an enlargement, but after castration the increase is due to the eosinophil cells.

In cases of tumors which destroy the anterior lobe, there appears a condition known as *dystrophia adiposo-genitalis*, that is a development of a super-abundance of adipose tissue throughout the body with involution of the genitalia and of the secondary sexual characteristics. Where there is an excessive growth of the anterior lobe during youth *acromegaly* is produced, that is gigantism, which is accompanied by genital hypoplasia. Geller found that after treatment of the hypophysis by *x*-rays the growth and development of the body ceased, and likewise that of the genital organs. On the other hand, an extract of the posterior lobe of the pituitary gland causes an increase of blood pressure and contractions of the uterus, very similar to the effects produced by ergotin (Fröhlich and von Frankl). Hofbauer was the first man to show the stimulating effect of pituitrin on the contractions of the uterus and who recommended it for general use in the midwifery.

The successful treatment of amenorrhœa by means of pituitrin, first originated by Fromme, Kosminsky, Hofstätter, also points to the close relationship between the hypophysis and the genital organs.

It is therefore reasonable to conclude that a diminution of the genital function may be caused by a dysfunction of the hypophysis; but we know also that the other ductless glands as well as certain parts of the brain, and particularly the region of the third ventricle, may play a rôle in this con-

nection. In cases of a defective condition of the pituitary gland there is apparently an absence of the hormone, which stimulates the ovary to function.

So we may conclude that for the normal process of menstruation, which on its part is dependent upon a proper function of the ovary, an intact hypophysis is essential.

You will no doubt be surprised to learn that I speak next of the pineal gland as being second in importance of the ductless glands. As Marburg and Biedl have shown, the pineal gland is most active during early infancy, and perhaps also during intra-uterine life. The hyperfunction of this gland at a later period is of great importance for the individual. We know that the development of adipose tissue in the fetus and child is in close relationship with the proper function of this gland. And we also know from experiments and clinical experiences that the pineal gland restrains the growth of the sexual organs, and that the absence of its full function provokes a premature sexual activity. It is also established that with tumors of the pineal gland premature genital development takes place, and that the absence of this gland brings about a genital development which should normally occur much later. Hofstätter believes that he has successfully treated a pathological increase of sexual desire of an imbecile child by means of epiglandol, that is, a watery extract of the pineal gland.

We know that diseases of the pineal gland may produce an abnormal deposition of fat, and that this gland also influences the vasomotor system of the skin-vessels; both these effects play an important rôle in the sexual life of a woman. Just consider the production of adipose tissue and the vasomotor disturbances which are associated with the onset of the menopause, and you will grant that there are close connections between genital organs and the pineal gland, which, although as yet are not perfectly understood, exist we know without doubt.

Of profound interest are the relations of the thyroid to genital functions. It is known that this gland shows a swelling during puberty, pregnancy and at each menstrual period. At this point may be mentioned Zuckermann's observation, that with congenital aplasia of the thyroid an

enlargement of the hypophysis takes place. I myself have studied the relation of the thyroid to the genital functions especially in cases of exophthalmic goitre. In these cases I proved that the thyrotoxin frequently produces even in the early stages of the disease an ovarian lesion and amenorrhœa.

In order to have a clear understanding of the inter-relationship between the ovary and the thyroid, it is necessary to study their respective relationship upon the sympathetic system. And there we discover the following facts. The ovary and the chromaffinic system are antagonists. The absence of the ovary protects the chromaffinic system and consequently the sympathetic system. On the other hand, the thyroid furthers the chromaffinic system and increases the irritability of the sympathetic nerves. Therefore the thyroid and the chromaffinic system are synergists.

The ovary decreases, the thyroid increases the blood pressure. During the climacteric and after castration we find increased blood pressure, and accelerated pulse rate. Therefore we observe that the ovary and the thyroid in their relation to the sympathetic system have diagonally opposite effect. In climacteric women the sweating, the trembling and the heart-beat certainly depend upon the thyroid. The increase of adipose tissue is probably due to the hypophysis, the flushings to the adrenals, as far as the sympathetic nerves of the head are influenced by the adrenals. It is to be remarked that the removal of the thyroid in young animals provokes disappearance of the follicles and a hypoplastic condition of the ovary. Lanz found that after extirpation of the thyroid in goats sterility and atrophy of the mammæ occurs. Also in myxœdema we find regularly involution of the genital organs.

We are not astonished to find that the adrenals work in close connection with the genital system, since we are informed through Takamine (1901) about the qualities of the adrenaline. Nowak found after extirpation of both adrenals in rats either a hypoplasia or an atrophy of the genital organs, as well as after artificially produced tumors of the adrenals. On the other hand, we find through the experiments of Schenk a hypertrophy of the adrenals after castration. However, this does not indicate an increase of the

production of adrenaline, but, on the contrary, the production of adrenaline is diminished in the hypertrophy of the cortex of the adrenals, since it is a secretion of the marrow.

The inter-relationship of the chromaffinic system either to the ovary or to the thyroid have already been discussed. Towards the end of pregnancy the adrenaline production shows an increase, and Kehrer is of the opinion that it plays an important part in the onset of labour.

In this connection I wish briefly to speak about the thymus. The maturing of the ovary brings about it the physiological involution of the thymus. On the other hand, the status thymico-lymphaticus always is accompanied by hypoplasia of the genital organs.

Therefore it is obvious that the function of the genital organs through many channels is connected with the ductless glands. So now we will be able to fully comprehend the rôle of the ovary as a regulating central organ for the onset of the menstrual period.

Menstruation is influenced by a rhythmic increasing and decreasing influx of blood into the uterus. The cyclic change of the blood supply becomes regulated through the hormone, which is elaborated in the ovary and absorbed in the bloodstream. This hormone is produced only then, when the ovary is maintained in proper functioning condition through checking and spurring on of the other ductless glands. All other ductless glands act in a protecting or checking manner, but at all events they act as a determining factor upon the proper function of the ovary.

Now we are prepared to study the time and casual relations between the different phases of the ovarian activity and the uterine function. Which portions of the ovary are to be considered as hormone-producing tissues? Undoubtedly the ovum cell is of highest significance. If the ovum dies, then the corpus luteum is involved; if the ovum becomes imbedded, it influences a persistence of the corpus luteum. Therefore we can conclude that the involution of the corpus luteum marks the death of the ovum. Since the beginning involution of the corpus luteum is synchronous with menstruation, we can also conclude that menstruation marks the already established death of the ovum.

If the ovum becomes imbedded in the mucous membrane, then the corpus luteum persists and menstruation does not take place. Bleedings during pregnancy are without exception pathological, and originate usually from erosions or polypi.

Also the follicular epithelium during all stages of maturing of the follicle, especially the corpus luteum, derived from it, is of inner secretory significance. The older investigators, Pflüger, Leopold and Ravano, were still of the opinion that ovulation and menstruation are coincident. It is to the merit of Fraenkel, in Breslau, to have found that the follicle ruptures between two menstruations. Based upon exact microscopical examinations, performed by Meyer, Ruge, Schroeder, we know to-day that the rupture of the follicle occurs between the 14th and 16th day after the last menstruation. There exists an ovarian and a uterine cycle, and between them exists the closest relation—one is dependent upon the other. After the follicle is ruptured, the corpus luteum is formed. According to the various stages of development of the corpus luteum we distinguish a stage of proliferation, vascularisation, matured stage and different stages of involution, whose end effect is the so-called corpus albicans or the corpus fibrosum

The mucosa of the uterus shows a very different construction depending upon the stage within the cycle from which the specimen was taken. Directly after menstruation the mucosa is thinned out from one half to one millimeter, is anæmic, and the glands are contracted and without secretion. We call this a postmenstrual mucosa. Gradually, during the intermenstrual period, the mucous membrane becomes thickened, and correspondingly increased in vascularity, the glands become distended, more tortuous, with more mucous content. Toward the end of the interval, in the premenstruum, the mucosa has become very thick, to the extent of 10 or 15 millimeters. The mucosa has become more vascular, the vessels are widely dilated, so that the connective tissue has an œdematous appearance, a most remarkable fact, because we meet for the first time a physiological œdema, while we are accustomed to regard œdema as something pathological. The glands are at

maximum dilatation, tortuous, and full of secretion. Here we must note that only the middle portion of the glands secrete, while the neck and the fundus of the glands remain contracted, inactive. The stroma between the neck of the glands has undergone a change, which consists in a marked swelling of the connective tissue cells, and reminds one to an extent of decidual cells. The menstruating mucosa shows us during the first stage bleedings into the tissue and gradual bleeding into the uterine cavity, and with it a sudden collapse of the whole mucous membrane. Blood pours out of the vessels, mucous out of the glands, œdema fluid out of the stroma, and so it follows that the mucous membrane in a few hours becomes thinned out from a 10 or 15 millimeters diameter to that of half a millimeter. In this way the entire surface may be thrown off, and only the fundus of the glands remains, or there is only a collapse of mucous membrane without any destruction.

The rupture of the follicle occurs between the 13th and 17th day. While the corpus luteum is developing, the secretion of the glands gradually increases, the mucosa becomes thicker and prepares itself for the reception of an ovum. If the corpus luteum is at the height of its development, the mucosa is premenstrual. Now the ovum dies. Its long-distant, stimulating effect upon the corpus luteum disappears, the corpus luteum shows a fatty degeneration. Now menstruation is established. The corpus luteum is transformed into a fibrous body, which soon disappears. At the same time another follicle has developed. As long as the corpus luteum is at the height of its development, it does not allow another follicle to be fully formed. The corpus luteum is an autocrat, and does not tolerate another master while it is itself the master of the situation. It watches over all functions, which must be performed. When the corpus luteum is degenerated, then another follicle may ripen, and the play is repeated.

Thus we can say, and clinical and experimental facts permit of no doubt, that the corpus luteum prepares the mucous membrane for the reception of an ovum. The corpus luteum operates upon the mucous membrane in a

constructive sense by its hyperæmia-producing stimulant; this was experimentally proved. But the menstrual bleeding is provoked by the involution of the corpus luteum. Halban and Köhler have established through their clinical observations, that after extirpation of the fully developed corpus luteum, a few days later menstruation sets in. In the same sense are to be taken the experiences of Seitz and Wintz. After Roentgen-castration by one exposure, which was applied at the beginning of the interval, an immediate cessation of menstruation was observed. However, if the woman was near the end of the interval, the menstruation recurred once before total cessation. The death of the corpus luteum, therefore, produces the menstrual bleeding.

How can we explain this apparent contradiction, that the same hormone produces hyperæmia of the mucous membrane, and its absence provokes the menstrual bleeding? In this case it is necessary to investigate more extensively, and to clear up, in what manner the menstrual bleeding is really brought about. I have pointed out to you that during the premenstrual stage the glands of the mucous membrane are distended with secretion in their middle portion. This mucus contains, as I have demonstrated with Halban and Aschner several years ago through chemical investigations, an abundant tryptic ferment. As long as the corpus luteum gives off its hormone, the mucosa of the uterus is hyperæmic, and through the turgor the efferent ducts of the glands are more or less closed. When the corpus luteum begins to involute, the hyperæmia suddenly subsides, the turgor of the tissue becomes diminished, the efferent ducts of the glands are opened, and the mucus escapes. This tryptic-mucus brings about a digestion of the mucosa, either more superficially or by penetrating more deeply, and casting off of the surface.

The apparent absence of coagulability of menstrual blood, while the blood in the general circulation has retained its normal coagulability, is explained by the fact that the menstrual blood is mixed with tryptic secretion of the uterine glands. This trypsin dissolves fibrin, and so the coagulation of the menstrual blood is prevented.

Thus it is comprehensible that the corpus luteum produces a gradually increased hyperæmia, gradually increased thickening and secretion in the mucous membrane. The bleeding appears when the corpus luteum involutes as a consequence of the death of the ovum.

Now, we must shortly consider the pathological aspects of menstruation, which are for you as practitioners of an especial interest. Occasionally it is possible to overcome an amenorrhœa by giving ovarian extract. This can be understood. For, according to the experiments of Aschner, one can produce a hyperæmia of the uterus by ovarian extracts. When the hypophysial impulse is absent it may be possible to re-establish the failing menstruation by pituitrin. And, indeed, we are able in some cases of amenorrhœa, by injections of pituitrin to start the menstrual flow. A very successful means for stimulating the ovarian action we have in the so-called "irritating radiation," this is the application of small doses of x -rays to the ovaries. They work in a stimulating manner upon the action of the ovaries, and thus we frequently are enabled to overcome an amenorrhœa. During the late war we so frequently had the opportunity in Vienna of observing amenorrhœa, and could not infrequently prove to our satisfaction the efficiency of the "irritating radiation."

A few words more about meno- and metrorrhagia. I exclude here entirely the myoma bleedings, as these are based upon conditions altogether different from the true metropathic bleedings. It is probable that through inflammatory processes, and through congestion, a chronic and a permanent hyperæmia of the ovary is induced. This leads to a premature and sudden ripening of the follicles, in which none come to a full development or complete rupture. Therefore, the corpus luteum is lacking. The lining epithelium of the numerous follicles, which have undergone cystic degeneration, produces a chronic hyperæmia of the endometrium, which is followed by hyperplasia, sometimes by polyposis of the mucous membrane. The intensive chronic hyperæmia is sufficient in itself to produce bleedings. The ovary is invaded with many small follicle cysts. The uterus shows an inclination towards meno- and metrorrhagia,

but without any local inflammatory condition, the condition being exclusively based upon hormone stimulants, which are due to the hypophysis, or to hyperfunction of the ovary.

Since we are unable up to the present time to isolate and subject the hypophysis to treatment, we must resort to *x-ray* treatment and the vaginal extirpation of the uterus in such cases. To what extent abnormal function of the adrenals or the pineal gland play a role in these cases, remains in the field of future investigations. We have here an extensive field of research ahead of us. Just as we are able at the present time to test the function of the liver or the kidney, we must study functional tests for all the ductless glands in future. Only when we have reached this goal, will we be in a position along with other advantages to influence a typical bleeding without the heroic methods which we employ, such as *x-ray* or extirpation of the uterus.

You have noticed that in this whole exposition the term "interstitial gland" in the sense of "puberty-gland," as Steinach calls it, was not employed. I consider that an interstitial ovarian gland in a sexually matured woman can not be demonstrated histologically, and that up to the present we have no proof either for its existence or for its function. Therefore, I can absolutely not agree with Steinach as to his rejuvenating experiments.

With this I have finished my arguments. I am cognisant of the fact that I have left many loop-holes open. My purpose was to stimulate you to further research work along these lines, and I shall be satisfied if I have succeeded in arousing your interest in this very important field of medical investigation.

II.

EARLY DIAGNOSIS OF CARCINOMA OF THE UTERUS.

I have taken the early diagnosis of carcinoma of the uterus as the object of my discussion for to-day, because I am of the opinion that this subject is not only of the greatest importance to the pathologist, but also for the general practitioner. If it is true that the early diagnosis

and early treatment means the saving of the patient, then it is our duty to do everything in our power to make the earliest possible diagnosis. Every means must be considered if we intend to bring about a favourable prognosis in uterine cancer. All this is only then of weight, if it is really a fact, that early surgical interference gives a better prognosis than that of a late stage operated carcinoma. In fact there are some authors who were of the opinion that the early operated carcinoma does not give a better prognosis than the operation at a later stage. It will not do to form an opinion which is based on prejudice or on the ground of general impressions, but one must take the pains to investigate the matter systematically, and only then can one form a judgment.

I have already talked and written on this subject in 1912, and was in a position to come to the conclusion that among the uterine cervix carcinomata, which were treated surgically at our Vienna clinic between the years 1901 and 1907 by means of the most radical vaginal operation, there were only 12 beginning cases. Of these after five years eight were still healthy; only one of these cases had died from her carcinoma. Four cases were lost sight of or died from some other intercurrent disease. If we now compare these very favourable results with those obtained by the best operators in all their carcinomatous cases with both vaginal and abdominal extirpation, we find that the absolute percentage of cure varies between 16 and 25 per cent. In opposition to this we can say, as I did in 1912, that in early uterine cancer, cure is the rule, recurrence the exception.

If we want to discuss early carcinoma, we must first establish what constitutes a beginning carcinomatous tumour. In order to avoid errors, we must in the first place study the ordinary extension of the carcinoma of the womb.

The cancer of the uterus is assuredly not one of the most malignant localisations in the human body. Above all it is noticeable how late and how rarely metastases occur in other organs. But metastases in the regional glands occur after some time, but not directly at the beginning of the neoplasma. It is of primary importance for us to know where is the primary seat of the lesion,

and with what conditions we are dealing. We must make a positive differential diagnosis between carcinoma of the corpus and of the collum of the uterus. The latter is far more frequent, the former rare. The latter is more malignant on account of its tendency to spread into more important fields than the corpus cancer, which proliferates into the uterine cavity, because this offers less resistance, and which only relatively late penetrates into the substance of the uterine body. Not so with the cervical cancer. This originates at the junction of the stratified epithelium of the vaginal portion with the glandular epithelium of the cervix. However, it also proliferates towards the vagina. But those portions of the neoplasma which proliferate into the cervical canal find there a rigid tube, which is hardly dilatable, and thus the proliferation extends into the cervix substance rather early. From this point further growth may develop in different directions. Either the cancer penetrates early into the lymphatics of the parametrium, or it soon consumes the entire parametrium. Therefore the question which is of paramount importance to us is to determine in what stage of development the carcinoma may be within the parametrium.

The cervix carcinoma has also the further tendency of growth. At first the vagina may become involved; but also the neoplasma may involve the anterior or posterior septum and penetrate into the bladder or the rectum. Both are serious complications, and both make for a more unfavourable prognosis.

What do we understand by an early stage? On the one hand we speak of an early stage when the cancer is still so small that it can be detected only microscopically, but that after the extirpation of the uterus the cancer can neither be recognised macroscopically nor microscopically in certain instances. Also such cases in which the cancer could be seen with the naked eye, but where no definite tumour was discernible, and where in particular the surrounding organs (vagina, parametrium) were entirely free, were designated as early stages. Tumours which were small and localised, but had not invaded the surrounding tissue, were counted, but not

as an early stage, for Schottländer and Kermauner pointed out that even small tumours may have existed for some time, and not infrequently had caused a lymphatic propagation of the disease. Even small tumours need not be considered as an early stage, since we are well aware that some carcinomata are of very slow growth.

What clinical means have we by which we are able to make an early diagnosis? We must ask ourselves whether there are some definite early symptoms of uterine cancer. Unfortunately the answer is negative. But there are certain signs which we must always bear in mind. The more exact the physician is in his examination, the less he tends to neglect even apparently harmless things; the more frequently he will be able to discover early stages of carcinoma to the best interest of the patient and to his own satisfaction. I at least must say that it has always been gratifying to me when I could, in a case of carcinoma, make a truly early diagnosis.

Above all, it is a well-known observation that women who had passed the menopause suddenly begin to bleed. In recent times women are more than ever inclined to harbour the idea of rejuvenation, so that these women regard such bleeding as a recurrence of the menstrual flow and greet it as a sign of still present youth. The practical physician knows that such is not the case, for such hæmorrhages are nothing else than a symptom of beginning cancer. Not only bloody discharge, but more especially serous or sero-sanguinous discharge must be thoroughly studied. In such cases one must always investigate the portio, and if there is nothing particular disclosed here, the cavity of the uterine body must be dilated and a curettement performed. If there is at the vaginal portion a suspicious spot, the sound-test is to be made. This test consists in the fact that in the presence of a somewhat advanced carcinoma the blunt end of the sound easily penetrates the cancerous mass. If the neoplasma is in the very incipient stage, this test will usually fail. In all cases it will be necessary to make a test-excision.

Here I beg you to allow me to say a few words regard-

ing the technique of the test-excision and the test-curettement. An excision for examination should never be taken from the periphery of the ulcerated part of the portio, but always from the centre of the suspicious area. For it is possible that the benign parts are seen while the carcinomatous tissue escapes us. In reference to the test-curettement I recommend that the uterus should be most carefully dilated. Before curetting the cavity should be thoroughly explored with the sound. Not infrequently it will be possible to detect even small polypous excrescences and small elevations which the curette might otherwise slide over without bringing forth just the most important particles. The endoscopy of the uterus unfortunately has not fulfilled our expectation in this direction. Also the serum tests, according to the methods of Abderhalden, Crile, Freund and Kaminer, have thus far not proved of value in establishing a diagnosis.

I would like to mention briefly a few points regarding the frequency of early stages of the uterine carcinoma, since studies in this field are tremendously instructive.

When I looked over our collum cancer specimens in the year 1912, collected during the period 1901-1912, I found an average of 3 per cent., a truly very modest figure. Based on the same principles I have reviewed most carefully the specimens of collum and corpus carcinomata collected since the foundation of our new clinic in Vienna. In calculating the percentage not only the number of our specimens is of importance, but also the fact that I myself have examined the entire quantity of cases, so that the basis of all investigations has been uniform. It seemed to me of interest to look into the questions which Winter, about 20 years ago, worked out in such a meritorious manner, and to investigate how the frequency of the early stages of uterine carcinoma presents itself to us in these last so trying years.

Early cases of cervical and corpus cancer between the years 1909 and 1913 show an increasing percentage up to 10 per cent. Only the year 1911 gives us, for reasons which I cannot determine, the very unfavour-

able figure of 2, 9 per cent. This is followed, however, by a marked decrease in the year 1914. The extremely low figure of 2 per cent. increases up to the year 1918 to 2, 9 per cent.; in the year 1919 up to 3, 2 per cent. First in the year 1920 does it rise to 4, 5 per cent., and within the first five months of this year we are especially happy to have obtained more than 16 per cent. Even should this high figure depend upon chance, the figures of 1920 and 1921 undoubtedly show progress.

The question is, what factors came into play to produce the low percentage in the years 1914-1920. One might assume that the intensive ray-treatment which was carried out brought more inoperable cancers into the clinic, and that for this reason the relative frequency of the early stages was reduced. This is true up to a certain degree, but it is not the principal reason. For also in the years 1920 and 1921 a great number of women received *x*-ray and radium treatment at our clinic. I am much more inclined to believe that in this case, as well as in so many other fields, the war was the unmerciful strangler. Innumerable women had been called upon to perform hard labour; they found no time to observe the conditions of their own bodies, and thus failed to give their abnormalities proper attention. And so the number of women with beginning uterine carcinoma which came to the clinic rapidly decreased. After the war these circumstances have greatly improved. During the present year we have remarkably favourable figures to show, so that we may hope that there is a change for the better in this direction.

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The histological diagnosis of early carcinoma is, of course, not difficult to make for the physician who is thoroughly familiar with normal histology of the tissues. As a rule, it is not advisable for the practising gynaecologist to make such examinations himself, and it is better to leave these to the pathologist. It is, however, a great advantage to be well orientated as to how the cancer diagnosis is performed. The physician who is familiar with the pathological changes, will decide with greater assurance, than the poorly orientated one.

In my first lecture I demonstrated to you the various

changes in the normal mucous membrane of the uterine body. Although the mucosa changes according to the different phases of the cycle, we always find a well-defined, typical picture. The glands invariably show a single layer of epithelium; never do several tubes coalesce, but each tube is well isolated. The epithelium retains its cubical or cylindrical form. During the secreting stage the cell is less sharply defined, as is always the case with a secreting cell.

A carcinoma can develop in the area of a mucous membrane or of a stratified epithelium. To-day we no longer hold the opinion that a cancer develops from one fully-developed element of a mucosa or of a stratified epithelium; we are rather of the opinion that incompletely-developed, embryonic cells, which had not been utilised in the building up of the mucous membrane or that stratified epithelium, which had remained unused, represent the starting-point of a cancer. The neoplasma, which originates from these embryonic cells, simulates more or less exactly the structure of a mucosa or of the stratified epithelium. Therefore we distinguish on the one hand glandular, on the other hand solid cancers of a varying maturity. In the glandular type we find within the carcinomatous projection a cavity, which reminds us more or less of a gland cavity. In solid cancers we miss such a lumen. According to the picture of a typical epithelium, whether it is more or less completely formed, we distinguish different degrees of ripeness.

I examined several early stages of solid cancer. One sees very plainly the beginning carcinomatous changes in the specimen, taken from an epithelial fold about the size of a pin-head, at the region of the external os. One sees at one side a typical stratified epithelium with normal papilli, of which the three parts of the epithelium are still recognisable. This arrangement is soon lost, the papilli become thick; at the other side you already see the fully-developed carcinoma. The epithelium has completely lost its typical form and its typical arrangement, and already solid cancer projections reach into the depth.

Another very early stage of cancer development in the region of the flat epithelium of the vaginal portion shows at the border of the slide that the epithelium is still perfectly

typical. It shows a sudden upheaval. The arrangement in the three parts disappears; at the surface appear large, polymorphic and very deeply-stained nuclei, and there is an absence of the regular basal cell layer. Here, too, we discover a cancer projection burrowing into the depth in a most typical fashion. High-power specimens show in this projection the complete absence of the regular basal cell layer, the appearance of nuclei of an abnormal size and shape, which are obviously undergoing a typical division. There is no doubt that we are dealing here with an already established cancer.

The youngest cancer which I examined is a case in which only a very tiny nodule could be detected with the naked eye. The patient presented herself at the clinic because she had noticed a muco-purulent discharge. The nodule was not cancerous, but proved to be only a little hump of the typical stratified epithelium. However, in the furrow at the base of the nodule we discovered a cluster of atypical cells lying apparently free. This finding, which in itself was not plain to us, was explained by the examination of further sections. A further slide shows us that this atypical epithelium proliferates into the depth, and that the typical epithelium is obviously interrupted. The connection between the typical and the atypical epithelium is seen in some slides.

An early glandular carcinoma in the region of an erosion shows us a typical cervical gland, and alongside of it a many-layered epithelial mass, which shows a lumen, and which, in contrast to the nicely-developed cervical epithelial elements, consists of most atypically-formed cells. From the fundus of this body, which only poorly imitates a gland, a solid cell proliferation penetrates the depth.

Finally there are some pictures of early cancer of the mucosa of the uterine body. We see in a normal premenstrual mucous membrane that the epithelium in the different layers has different aspects, but still has the single layer arrangement, and remains true to the original columnar cell form. It is otherwise with a beginning carcinoma. The epithelium in different portions is multiple layered, has lost its cubical

form, the glands coalesce here and there. In another slide one can see that there arise in some portions, solid cell masses.

So we can understand that as a rule it is not so very difficult to make a diagnosis of cancer even when it is an early stage. Should you be in doubt, then make a second curettement, a second excision, 14 days later, and one certainly will arrive at a correct diagnosis.

I come from Vienna, the city which can claim for itself a special page in the history of surgical interference in uterine carcinoma, where such men as Wertheim, with his extensive abdominal, and Schauta, with his extensive vaginal, extirpation of the carcinomatous uterus have made such large contributions to the surgical treatment of uterine carcinoma. It is not very probable that further progress in operative technique will greatly influence a more favourable prognosis. It is far more important that early diagnosed cases should come to the operating table. The less the parametrium, the bladder, and the rectum are infiltrated the greater will be the facility of operating in the healthy field, and the more effective will be the operation. Also the primary mortality is far less in early stages, for the operation consumes less time and goes on more smoothly than in advanced cases. Also accessory injuries, especially fistulæ of the ureter, will result less frequently.

The modern *x*-ray and radium treatment of uterine carcinoma did not originate in Vienna, but they are extensively resorted to there, and we have already very considerable experience in this field. What we have said of the operation we can, *ceteris paribus*, also claim for ray treatment. Our clinic only operates upon the operable cases and treats with rays the inoperable cases. But for those clinics, which also treat with rays operable cases, it undoubtedly is true, that beginning cases treated by *x*-rays are easier to cure than far advanced cases. Early cases are preferably subjected to radium treatment, but at the same time they should also be treated with *x*-ray. No doubt, the smaller the field invaded by cancer, the more completely will the

tumour fall within the limits of the effective rays, and with the result of destruction of the cancer mass.

I trust that I have convinced you of the significance of the early diagnosis of uterine cancer, and that I have stimulated you to give each suspicious case the fullest possible consideration. For in few fields of medicine does it hold so true as in this, the old Latin saying, *principiis obsta!*

III.

X-RAY AND RADIUM TREATMENT IN GYNÆCOLOGY.

IN the history of gynæcology there are few discoveries which have called forth such a revolution in therapy as was the case through the discovery of *x*-rays and radium. It is difficult, in fact impossible, to present in one lecture the importance of *x*-ray and radium for the gynæcologist. The task before me is all the more difficult since the mode of application of the *x*-rays is basically different from that of radium rays. In spite of this it is essential to discuss both these methods at the same time, for both are to be considered from the same physical and biological point of view.

May I be permitted to bring before you only a few important facts relative to the gynæcological ray treatment, because I may take it for granted that you are perfectly familiar with very many points of this therapy.

I cannot avoid briefly to trace out some of the historical developments of this modern treatment, because just in this scientific field it is clearly seen how, by an ingenious discovery, new successes rapidly follow upon each other. The adaptation of *x*-rays to gynæcology was not thought of until 1902, when Scholz had proved the different effects of *x*-ray upon different tissues. Already one year later Albers-Schoenberg came forward with his fundamental findings, that without injury to the skin azoospermia could be produced. Through this it was clearly shown that effects upon deeper-lying tissues are possible. The theoretical foundation of this discovery was given by Perthes and Des-

sauer through their intensive studies of the absorption of rays. They are to be regarded as the real fathers of deep-therapy. In 1905 Halberstätter came forward with the statement that the ovary reacts in a characteristic manner to the *x*-rays with destruction of the follicles without evident trauma to the skin of the abdomen. The facts gained through experimental investigations were adapted to the field of practical gynæcology by Manfred Fraenkel and Albers-Schönberg in the year 1909, which taught us their use in myomata. Krönig and Gauss then confirmed in a great number of cases the effects of *x*-rays in myoma and hæmorrhagic metropathia. The use of *x*-rays in the battle against uterine carcinoma dates back only a short time, since we have succeeded in producing apparatus of a high efficiency. Seitz and his co-workers have accomplished much in this respect.

With the same rapidity the use of radium advanced. Four years after the discovery of radium by Monsieur and Madame Curie in 1898, that is in 1902, Danlos tried the use of this newly-found element for therapeutic purposes. The American Abbe was probably the first one to use radium for the treatment of uterine carcinoma. He effected healing in two cases of carcinoma colli.

The credit for systematic application is due to the French, especially Wickham and Dégrais, who, in the years 1906-1909, and Chéron and Rubens-Duval, who, in the year 1911, with special industry, had applied radium in carcinoma of the female genital organs. Dominici placed this treatment upon a real foundation when he taught us, in 1907, by the use of a filter, to eliminate the soft rays and to make use of the ultra-penetrating, the hardest rays. In 1912 Chéron and Rubens-Duval could already give us the data on 158 cases, in which 77 showed the disappearance of carcinoma; 46 cases had not recurred for one year, a number of them not even after several years.

The Vienna school took an early active interest in the application of radium. Exner had treated a cancer of the angle of the mouth in 1903, and an œsophageal carcinoma in 1904. In this year he published an account of his histological findings in radium-treated cancers. Also Holzk-

necht, in 1903, had worked with radium in a case of carcinoma of the cheek.

Great progress was made in Germany in the radium treatment of malignant neoplasms of the female genitalia in the year 1912. In the memorable congress at Halle, when Krönig, Bumm, Döderlein and Gauss demonstrated their cures, which bordered on the miraculous, we sat there as though we could not believe our own ears and eyes. And anyone who, like myself, looked upon this early enthusiasm somewhat sceptically, was ridiculed as being unprogressive and pessimistic. To-day we know that x -rays and radium are mighty therapeutic agents, but not almighty. The effectiveness of these physical methods of treatment has its certain limits, which perhaps can be somewhat extended; but as yet we have not found the specific and absolute remedy for cancer.

I now want to discuss some of the weighty principles of ray-treatment which are of fundamental importance for the practising physician. At first we shall consider filtration. Just as in the x -rays, we also distinguish in radium Alpha, Beta and Gamma-rays. Gynæcological treatment is without exception, including vulva cancer, a deep treatment. We shall therefore be obliged to work always with the use of filters in both Röntgen and radium treatment. In x -rays we use 3 mm. brass or 0,5 mm. zinc for elimination of the soft rays, and in radium it is best to use the Dominici-tube. The latter is composed of brass 1 mm. thick, and this is covered by a rubber tube. The entire tube has a length of 2-4 cm., and with the filter a thickness of 3-5 mm.

I emphasize now that I consider the insertion of the radium into the cervical canal as more efficient and also less dangerous than in the vagina. The end of the Dominici-tube which projects from the external os is covered with a cylinder of paraffin, which is about 3-4 cm. long, and concave on both ends. The whole is secured in place by a piece of gauze, which was dipped in a rubber solution. Radium should never be applied in too large a dose. Our experience is to use about 50 milligrams of radium element. The duration of a single application is from 12 to 24 hours.

From 4 to 5 sittings compose a series, the intervals between the sittings of this series are of 12-24 hours. The amount of the applied rays is expressed in milligram-hours (mgh), which physically is rather inexact. One series should not exceed 3,500 milligram-hours. A second series follows the first after 3 or 4 weeks, a third may follow about 10 weeks after the first. Rarely a fourth or fifth series is required.

We must not allow ourselves to have too fantastic ideas about the extent of the effect of radium. The effect does not reach beyond a distance of 4 cm. from the ideal centre of the tube. We may never forget the fact that the effectiveness of radium decreases in ratio to the distance; the peripheral portions do not receive the full, but a much smaller dose—a dose which is not only unable to destroy the carcinoma, which might be present, but which may act as a stimulant. We must absolutely avoid stimulating rays coming into touch with any part of the carcinoma. The effect of small doses gives rise to rapid proliferation and early metastasis. This is the reason for simultaneous *x*-ray and radium applications in uterine carcinoma. Radium is especially useful for the destruction of tumour-cells, which lie in the immediate vicinity of the cervical canal. However, for the destruction of cancer in the parametrium or in the lymphatic glands it is better to employ the *x*-rays.

The best system we know of to-day is the “Symmetric” apparatus. This apparatus permits the production of extremely hard rays.

Dessauer sees the ideal treatment in a homogeneous radiation of the whole tissue. That is, the entire field exposed to the rays is penetrated by the same quantity and quality of rays, which naturally is physically impossible. But this can be accomplished to a very high degree with the “Symmetric” apparatus by the use of self-hardening boiling tubes and by applying of the *x*-ray tube at a sufficient distance. If all the cells within the radius of the rays are given the same quantity and quality of rays, then the specific varying sensibility of the tumour element in comparison to the normal element can be brought into play without any damage to the normal cells. We know that every

cell of the human body without exception is sensitive to the x -ray or radium rays, however, in varying degrees. Fortunately cancer cells, and also the specific ovarian cells, are far more sensitive than normal connective tissue cells. So it is possible, by the use of certain qualities and quantities of rays, to destroy the tumor cells and follicles, without any harm whatsoever to the surrounding connective tissue.

Only recently we have succeeded in measuring exactly the x -ray dose by means of the so-called iontoquantimeter. In the case of radium it is not as yet possible. We select as unit such an amount of rays, which is sufficient by homogeneous Röntgen radiation, or by filtered radium radiation, to produce after 8 or 10 days a slight reddening of the skin, and which causes in 4 or 6 weeks a slight brown colour. This is called the skin erythema dose or skin unit dose. According to the experience of Seitz and Wintz, Adler, 100 or 110 per cent. of this dose is just sufficient to destroy cancer cells. It is therefore our object to expose every carcinoma cell to this dose. The extreme difficulty lies in the impossibility of exposing all layers of a cancer mass which is of a certain thickness to this dose. If we apply an insufficient dose, we provoke irritation and further proliferation. If we apply too large a dose, then the surrounding healthy tissues are injured. In the treatment of uterine carcinoma the most sensitive organs in the vicinity are the bladder and the rectum, and both are very easily injured.

In order to avoid difficulties, we have selected the method of cross-firing, that is, the application of rays from different angles. We use 3-5 avenues of entry the abdominal route, 3-4 routes from the back, 1-2 from the perineum. At the same time radium acts from the region of the cervical canal.

I will now show you by means of some diapositives the action of radium rays upon cancerous tissue. The effects produced by the use of x -rays are, if we leave out the time factors, the same as those of radium, so that we can obviate a separate description.

To determine the gradual changes brought about by radium, I myself and Dr. Amreich have attempted to learn by means of serial examination of excised material taken at different intervals from the crater and its edge, at what

stage the action of radium is greatest and the point at which the effect of radium begins to lessen.

Our observations were made in a case of papillary carcinoma with small, densely-packed cells of an immature type with extensive involvement of the stroma. In this case we were able to make a precise study of the changes produced by radium treatment.

Three days after the first treatment the tissue excised from the crater showed œdema of the stroma and the formation of œdematous lacunæ, together with a number of intact carcinomatous nests. There was also extensive vascularisation.

Examination of a small piece of tissue from the edge of the crater showed no marked changes.

Four days after the first, and 12 hours after the second treatment, we found that the carcinoma cells directly played upon by the rays were greatly swollen, the nuclei were increased in size, but well stained. The stroma showed disintegrating and œdematous changes; the alveoli were surrounded by an œdematous fluid preventing the stroma from adhering closely to the epithelial nests.

Pieces of tissue taken from the edge of the crater presented similar changes: slight œdema and in certain places enlarged carcinomatous cells.

On the fifth day after the first, and 12 hours after the third treatment we saw in those portions directly exposed a very marked œdema, the pseudopapillary tissue enormously swollen, and the vessels in these papillæ (which were elongated and thickened) were dilated. Epithelial cells were found detached from the nests and scattered in the detritus.

On the sixth day after the first treatment we noticed the same sort of changes at the edge of the crater; œdema separating the stroma from the alveoli of the carcinoma and numerous detached cells within the œdematous areas. The carcinoma cells were greatly increased in size.

On the seventh day we found the nests almost destroyed and a few cells lying at the periphery indicating the former extent of the carcinoma nest. In the centre were a few nucleated cells, also hyaline remnants of greatly-enlarged cancer cells. Areas of œdema were present, and the immi-

gration of lymphocytes caused loosening of the carcinomatous cell masses.

Exactly the same changes were observed in the portions which were only directly exposed to the rays. Vacuolisation was a distinct feature of the histological picture.

On the ninth day after the first, $3\frac{1}{2}$ days after the fourth treatment, we saw in the portions indirectly treated changes which indicated a turning-point in the effect of the rays; the alveoli were broken up, the cells showed enlargement, vacuolisation, and hyaline changes.

On the tenth and eleventh days we found a breaking down of the nests of carcinoma cells and penetration by the lymphocytes. These changes occurred in the portions which were exposed either directly or indirectly to the rays.

On the eleventh day the areas indirectly rayed showed in the centre of an alveolus (composed of vacuolised cells) a number of proliferating small carcinoma cells which indicated that the action of the rays was becoming less effective.

We will omit the changes recorded between the twelfth and twenty-fifth days after the first treatment.

On the twenty-sixth day after the first treatment we found that the areas which had been directly rayed showed scattered remnants of carcinomatous tissue with very few cells surrounded by hyaline and structureless cell aggregations.

Forty-one days after the first treatment, we found, besides the altered tissue masses, rapidly-proliferating carcinoma cells of a type resembling those present before treatment.

The areas directly exposed to the rays showed the first changes on the third and fourth days; the influence of the rays was greatest between the fifth and seventh days; the rays were no longer effective after the fortieth day, when the genoceptors of the cells became active and caused proliferation. Areas indirectly treated were slower in showing the changes and the effect of the treatment wore off sooner.

Comparing the results obtained from *x*-ray treatment and radiotherapy, we find the same histological changes: first, œdema, then enlargement of the cells and the carcinoma nest penetration of lymphocytes, vacuolisation, and other changes found after such treatment.

The enlargement of carcinoma cells does not seem to be desirable in radiotherapy; it is rather a form of cellular regression, and does not lead to cell destruction. Swollen cells may proliferate in every part of the alveolus. The nutriceptors are apparently injured to a greater extent than the genoceptors, and only the complete elimination of the latter prevents proliferation of the carcinomatous tissue.

You know that by use of x -ray and radium rays a reaction is brought about which is very similar to that produced by the abundant bibation of alcohol. The woman vomits, is very tired, becomes fatigued, complains of headaches, vertigo, and so on. This does not depend only upon absorption of necrotic carcinoma tissue, but also upon the fact that the blood shows a marked leukocytosis. It is very important to know that within two or three weeks the normal blood picture is re-established. It is of prognostic significance if the blood does not return to the normal within this stated time. This is a sign that we are dealing with a weakened, cachectic organism, which shows an insufficient regenerative power. In such cases one cannot expect any marked results from our ray treatment.

The value of a method is always decided by the results obtained with such a method. Then the question arises, whether, with other methods, we might not obtain better results? The operative treatment of uterine carcinoma certainly yields gratifying results, but we have no reason to be satisfied with the same. For, year in and year out, numerous women who have been operated upon die in consequence of recurrences. In the first enthusiasm some of the German gynæcologists went to the extent of declaring that surgical interference in uterine carcinoma was no more justified, since the treatment with x -rays and radium gives much better results. Let us compare the results of the two methods side by side. The number of absolutely cured cases, that is, the number of those which remained healed after a lapse of five years, referred to all cases of uterine carcinoma which came to the different clinics, are, according to Döderlein, 17 per cent.; to Wertheim, 18 per cent.; to Sellheim, 20 per cent.; to Franqué, 26 per cent.; to Franz, 28 per cent.; to Schauta,

22.5 per cent. The five first-named authors chose the abdominal route; the last-named, my late chief, Friedrich Schauta, the extensive vaginal route.

Besides the results obtained one must also take into calculation the primary mortality, which is, in the case of the vaginal operation at the present time, about 4 per cent. But also ray treatment has its disadvantages. One has to take into account even a primary mortality, for it is possible that by introduction of radium we can produce an infection and sepsis. The danger of accessory trauma, especially of the ureter, during the operation of the uterine carcinoma finds its analogy in the danger of formation of a fistula in the bladder and the rectum after burns with the *x*-ray or radium.

Baisch's figures show an absolute percentage of cure of 4 per cent. with radium treatment of uterine carcinoma after a period of 4 years; Heyman claims to have obtained almost 27 per cent. In opposition to this Eckelt could obtain only 7 per cent. X-ray and radium in combination certainly give better results, but the time is still too short to allow us to speak of permanent cures. For the same reason it is also impossible to give out any figures as to the absolute efficiency of this combined treatment. We may therefore not take the stand that surgical and physical treatment of the uterine carcinoma are two antagonistic agents which exclude one another. On the contrary, the best result will be achieved by him who selects every case carefully, who treats one case operatively, another with rays; in particular, it is advisable to follow up an operated case with radiation.

We must bear in mind that ray treatment enables us in a certain number of cases to cure absolutely inoperable cases, and this is of very great significance. In inoperable cases Adler could show, after a period of 4 years, cures in 4, 4 per cent.; Kehrer, after a period of 5 years, 7 per cent.; after 2 years, 16.38 per cent. If we consider that all these cases would otherwise have died in a far shorter time, if we consider further that by *x*-ray and radium treatment the bleedings, the stench, and most of all the pain, are done away with, we will then not under-value the ray treatment even in these cases.

Our clinic operates under all circumstances upon all operable cases. We have chosen the vaginal route because the primary mortality is lower than in the case of the abdominal route, because the parametrium can be removed thoroughly, and because it has been our experience that where the regional glands were already invaded even the abdominal route was practically no more effective.

Up to the present I have been considering only cervical cancer. We do not recommend ray treatment in a case of corpus carcinoma. For in these cases surgical treatment gives such excellent results that radiation hardly competes.

Carcinomata of the vulva and the vagina have thus far not given very satisfactory results. The same holds true of cancer of the breast. With ray treatment of uterine sarcoma our clinic has not had much experience thus far. The Erlangen school considers sarcoma as a very gratifying field, since the sarcoma tissue is more sensitive to *x*-rays than carcinoma tissue.

Amreich has recently published the results obtained in our clinic during the last two years with the combined *x*-ray and radium treatment. Unfortunately 13 out of 42 cases of inoperable cervix cancer have withdrawn themselves prematurely from treatment. Seven cases can be regarded as cured. In five cases of vaginal carcinoma one operable case was cured, the others were lost. From 10 recurring cases after operation of cervix carcinoma 6 died, 2 discontinued treatment too soon, 2 are still alive, but not cured. One operable vulvar cancer died after radiation.

Adler reported recently the results in 52 cases of inoperable collum carcinomata in which only radium was employed. He found after a course of 7 years 13 in good health. Regarding the prophylactic after-treatment with rays he could cite that after a period of 5 years 58,8 per cent. of these cases showed no recurrence. He introduced the radium 4 weeks after operation. In view of the danger of this method he himself recommends *x*-rays as a preference. It is not possible to give any report on the after-treatment with *x*-ray, since we have not had the high-power apparatus in use long enough.

I shall now leave this field, and will discuss the ray treat-

ment in reference to myoma and hæmorrhagic metropathia—that is, pathological bleedings—in which neither changes in the adnexa nor tumour formation or inflammation of the uterus are present. Since the investigations of Halberstätter we know that by means of *x*-ray the follicular apparatus of the ovary is destroyed. In my first paper I have discussed the relationship between the follicular apparatus and the mucous membrane of the uterus. I have pointed out to you the cyclic recurrent stimulations which come from the ovary and their hyperæmic effect upon the uterine mucosa. If this ever-recurring hormone stimulant is lacking the uterus becomes anæmic. In this way pathological bleedings may come to an end and myomata may shrink.

The ray treatment shows its effect upon the ovary the more easily the closer the individual is to the climacteric. Younger women show themselves more refractory even towards large amounts of rays than older women. In metropathic cases we have in our clinic always employed only *x*-rays, never radium. Weibel of the Wertheim clinic has combined *x*-rays and radium, and reports 150 cases, of which only 4 did not respond to treatment and 2 showed a recurrence.

Concerning myoma, we take the stand that a trial should be made with *x*-rays in the women near the menopause and with a definite diagnosis of intramural situation of the not degenerated tumor. Such cases are usually accompanied by good results. However, there are various contra-indications to *x*-ray. Thaler recently has collected the data on our myoma operation, covering a period from 1914 to 1919, and found that among 479 cases no less than 377 could not be treated with *x*-ray, and had to be treated surgically. I shall show you 2 tables about *x*-ray treatment in cases of myoma and hæmorrhagic metropathia.

Results of x-ray treatment :—Bleedings (without any special finding.)
156 Cases.

Amenorrhœa	Improved	Unimproved	Radical operation	Questionable
113	24	11	5	3

Results of x-ray treatment in Myomata.
80 Cases.

Amenorrhœa	Improved	Unimproved	Operation later
55	10	6	9

I mentioned in my first lecture that in recent years we had obtained good results with small stimulating doses of *x-ray* in cases of amenorrhœa. Just as small doses may have a stimulating effect upon the growth of a tumor, small doses can also have a stimulating influence upon the follicular epithelium, through which hormone activity becomes increased, the hyperæmia of the uterus is increased. Thus the conditions for the onset of the failing menstruation are given.

The late surgeon Albert, one of the greatest teachers Vienna has ever produced and will ever have, once made the remark in his lecture: He who shall discover a true cure for cancer, for him will be erected a monument of pure gold on the Ringstrasse—the finest boulevard in Vienna). By rays we have been able to cure many a case of carcinoma, and permanently so. However, the golden monument has not been set up in anyone's honour as yet, for *x-rays* and radium are not the true, specific remedy for cancer. We must not allow ourselves to think that we are through with our labours. We are just at the threshold of our researches, and we may not as yet fold our hands. To have stirred you to a hearty co-operation in this field was the true object of my present discourse. And I wish nothing more heartily than that the golden monument to the discoverer of the specific against cancer may be erected here in the city of Dublin, which was so good as to invite me as its guest.

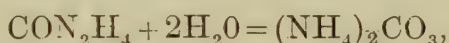
MODERN INVESTIGATIONS ON THE BREAKING DOWN OF UREA BY THE ENZYME UREASE.

By EMIL A. WERNER.

THE “alkaline fermentation” which urine quickly undergoes when exposed to the air is a phenomenon which attracted early attention.

At the end of the eighteenth century, Fourcroy and Vauquelin (1798-'99) proved that the carbonate of ammonia formed during the “fermentation” was produced from the urea originally present in the urine.

The change has been considered, up to the present time, to be a simple process of direct hydrolysis, according to the equation:



which was suggested by Dumas in 1830. Pasteur (1861) showed that a living organism was responsible for the change, and that sterilised urine, when kept from contact with air did not undergo ammoniacal fermentation. This fact, so well recognised to-day, was not accepted for many years by the upholders of “spontaneous generation.”

The particular organism was isolated by van Tieghem (1864), and was later given the name *Micrococcus Ureæ*. Ten years later, Musculus (1874) obtained an enzyme from putrid urine, which he showed was capable of decomposing a pure solution of urea, and was, therefore, probably produced by the organism in question.

Lea (1885) cultivated the *Micrococcus* in quantity, and confirmed the results obtained by Musculus.

Miquel (1890) described over thirty different varieties of micro-organisms, which he found were capable of decomposing urea in solution. He proposed the term *Urease* for the particular enzyme, which was, no doubt, common to all the micro-organisms examined.

So long as the source of urease was limited to microscopic organisms, none of which were cultivated on a large scale for any useful purpose, a thorough study of this remarkable zymolysis of urea was bound to be delayed.

In 1909 Takeuchi showed that an aqueous extract of the crushed Soy, or Soja-bean, the seed of a leguminous plant (*Glycine Hispida*), largely grown in Japan, possessed in a high degree the power of decomposing urea into carbon dioxide and ammonia.

Whilst this was the first discovery of the occurrence of urease in the higher plants, its presence in various leguminous, and in certain other seeds, has been recorded in recent years.

The sword bean (*Canavalia gladiata*), and particularly the jack bean (*C. ensiformis*), according to Mateer and Marshall (1916) contain the enzyme in much larger amounts than the soy bean, from which Takeuchi showed it could be easily prepared.

Since a plentiful supply of the enzyme became accessible much attention has been devoted to the study of the decomposition of urea by urease during the last twelve years.

Results of practical value, in connexion with the estimation of urea, and of much theoretical interest have been obtained.

Armstrong and Horton (1912) showed that urease (from soy bean) is without action on methyl-, ethyl-, sym-dimethyl-, sym-diethyl-, and asym-dimethylurea, and is also without action on biuret. To this list the writer can add, from his own experiments (1918), n-propyl-, phenyl-, and piperidyl-urea, thiourea, urethane, ethyl allophanate, and salts of guanidine and of dicyanodiamidine.

The specific effect of urease has been confirmed by other observers, and quite recently Wester (1921) has found that urease from *Canavalia* beans had no decomposing effect on a number of substituted ureas examined. It may therefore be taken as established, until proof to the contrary is forthcoming, that urease, at the average optimum point (45.55°) of enzymes, attacks urea only. So far as the progress of the reaction is concerned, Armstrong and Horton found that the addition of ammonia had a retarding effect on the decomposition of urea, whilst the presence of carbon dioxide increased the activity of the enzyme.

It was suggested, in explanation of the results, that urea is present in solution, in the hydrated form of "carbamide," $C(OH)_2(NH_2)_2$, which could give rise to cyanic acid by

loss of ammonia and a molecule of water, and if hydrolysed could yield ortho-carbonic acid and ammonia. The latter change was apparently the one determined by the presence of urease. Assuming that the enzyme must unite with the feebly basic urea in order to decompose it, the retarding effect of ammonia was explained by its power of interfering with such union. Carbon dioxide by fixing ammonia would facilitate the effect of the enzyme by leaving it free to act as a hydrolyst. In a later study, Armstrong, Benjamin, and Horton (1913) examined the effect of the presence of various substances on the re-activity of urease towards urea. Generally speaking, the stronger acids were found to retard the action, whilst feebly acidic substances, with the exception of boric acid, had an accelerating effect. According to van Slyke and Cullen (1913) the rate at which ammonia is formed by a given concentration of urease is not influenced by varying the concentration of urea from below 0.2 to 10 per cent. If the concentration of the enzyme is varied, then the initial rate of decomposition of urea varies proportionately.

It was concluded that urease must combine with a definite maximum quantity of urea, since the rate of the reaction was not affected by the presence of an excess of urea beyond this particular amount.

Marshall (1914) arrived at similar results, from which it may be taken as definitely shown that *the velocity of (the assumed) hydrolysis of urea by urease is proportional to the concentration of the enzyme*, under definite and limiting conditions.

The inhibitory effect of alcohol on the change was also examined by Marshall.

As the result of a more detailed study of the reaction, van Slyke and Cullen (1914) have proposed an equation, based on the law of mass active, to explain the progress of the change, which it is suggested may be applied to enzyme actions in general, on the assumption that two successive reactions are concerned in the change.

Since we are immediately concerned with the mechanism of the enzyme effect, rather than with the progress of the reaction, the reader is referred to the original memoir for the full details of the latter.

In the destruction of urea by urease the two separate phases of the enzyme's action are assumed to be: (1) Combination of enzyme and substrate (urea); (2) disruption of the combination with liberation of the urea as ammonia and carbon dioxide. Whilst it seems almost obvious that there must be a combination, or attraction of some kind between the enzyme and urea, the real question as to how the latter is actually decomposed thereby is left untouched.

A study of the effect of changes in the concentration of hydrogen ions on the progress of the reaction was made by van Slyke and Zacharias (1914). It was found, working over a range $P_H = 5.9$ to 8.7 , that the velocity of the combination of enzyme and substrate varied in inverse ratio to the hydrogen-ion concentration, i.e., the more alkaline the solution the more rapid the combination. The decomposition by the enzyme of the urea combined with it (the second phase of the reaction) was most rapid in neutral solution, and was retarded by either alkalinity or acidity.

Alcohol at 30 per cent. concentration had a retarding effect on both phases of the change.

Onodera (1915) found that methyl, ethyl, and propyl alcohols at molar concentration accelerated the activity of urease, but at higher concentrations (3.3 molar and upwards) they had a retarding effect. The inhibitory effect of acids on the change was further confirmed.

Bayliss (1915) in pursuing the theory that enzyme activity is manifested at the surface of contact between the solid enzyme and the substrate solution, has considerably amplified Marshall's and Onodera's observations on the activity of urease in the presence of alcohol.

The following results were obtained, after three days at room temperature:—

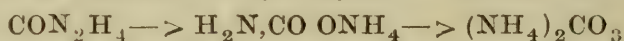
Alcohol.	Percentage of Hydrolysis of Urea.			
80 per cent.	7.8
83.3 ,, ,,	6.1
85.8 ,, ,,	4.3
89.3 ,, ,,	1.8

Thus the decomposition of urea by urease was effected even in the presence of nearly 90 per cent. alcohol; i.e., a liquid in which the enzyme was shown to be quite insoluble.

Bayliss points out, amongst other reasons, that a considerable activity of the enzyme is not to be expected in the presence of strong alcohol, as the low concentration of water retards hydrolysis.

Yamasaki (1918-'20) claims to have detected ammonium carbamate as an intermediate product in the decomposition of urea by urease, and in opposition to the views of van Slyke and Cullen, concludes that the mechanism of the change does not consist in the decomposition of a compound formed at the outset, with great velocity, as suggested, from the union of urease with urea.

Yamasaki assumes that the decomposing effect of the enzyme is a successive hydrolysis of urea; the reactions



taking place with about the same velocity. The change is a "simple catalytic action," carried on in the substrate without the formation of an intermediate compound with the enzyme. The retarding effects of electrolytes on the change is assumed to be due to their absorption by the enzyme, whereby its activity is diminished.

Armstrong and Horton found that ammonium chloride had a slight accelerating effect.

Barendrecht (1919) has put forward a "radiation" theory to explain enzyme action, which cannot be discussed here. So far as the system *urea-urease* is concerned, it is held that when the urease radiation strikes a molecule of urea it is absorbed, and as a result the urea is apparently directly hydrolysed. No explanation as to how this latter change is brought about is offered. Yet this is an all-important question to be solved before any theory can give a satisfactory explanation of the change.

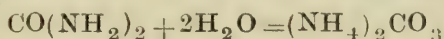
Barendrecht claims to have observed a reversion of the hydrolysis in solutions where the urease is shown to be "decaying," and to have observed a synthesis of urea from ammonium carbonate in any urease solution in which the enzyme is "decaying" through the combined effect of alkalinity, time and temperature.

Mattaar (1920) disputes the validity of Barendrecht's claim, and showed that a certain amount of urea added to a solution of ammonium carbonate was destroyed by urease. When we consider that Barendrecht's claim is based on an entirely erroneous conception of the relationship between

ammonium carbonate and urea, and of the mechanism of the latter's hydrolysis, it will be seen that its validity is more than doubtful.

After considering the results of the several investigations which have just been reviewed, it is evident that the important question, "What is the mechanism by which urease brings about the destruction of urea at such a comparatively low temperature?" has been left unanswered.

Whilst different views have been put forward to explain the mode of action of the enzyme, considered from a purely physico-chemical point of view, all the investigators have been unanimous in assuming a *direct* combination of urea with water in accordance with the old equation:

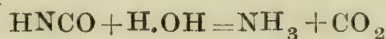


as the explanation of the final action of the enzyme.

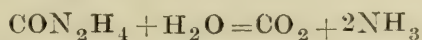
A discussion of the several theories which have been suggested to explain enzyme action would be out of place here; yet there is one hypothesis which cannot be ignored in connexion with the subject under consideration.

A theory which is favourably entertained by many, namely, that an enzyme acts catalytically as an accelerator of a change which is already in progress, is untenable so far as the decomposition of urea by urease is concerned.

It was proved by the writer (1918) that urea in solution in the presence of either acids or alkalis is *not hydrolysed at the ordinary temperature*, and any change in this direction, which must be preceded by dissociation of urea, is perceptible only at about 60°, and is even then extremely slow. In fact, urea is not directly hydrolysed at all, it is dissociated by heat into ammonia and cyanic acid, HNCO , and the latter is then hydrolysed, in accordance with the equation:



So far as the final results are concerned, the products correspond to the change



combination of the latter with water giving $(\text{NH}_4)_2\text{CO}_3$.

The action of urease is therefore remarkable in bringing about a rapid change at a low temperature.

It is interesting to note that van Slyke and Cullen have placed the optimum temperature of urease at 60°, which

is distinctly above the average optimum point for enzyme actions generally.

The specificity of urease, *so far as it has been established*, would appear to support the view that the urea molecule has a constitution peculiar to itself.

On the other hand, the mechanism of the decomposition of mono-substituted ureas in the presence of either acids or alkalis is similar to that of urea. The velocity of the reaction is much slower, thus Fawsitt (1904) found, $K_x^{10^5} = 48.5$ for methylurea, as compared with 101 for urea, all other conditions being equal. This indicates that a higher temperature is required to reach the point at which methylurea undergoes dissociation, than in the case of the less stable urea.

We know that the first stage in the "hydrolysis" of urea, i.e., dissociation into ammonia and cyanic acid, is a function of the temperature. Acids or alkalis each exert two effects, which act simultaneously in opposite directions on the progress of the change. They retard the first stage by lowering the concentration of "free" urea, and accelerate the second stage by removing the products of dissociation so fast, more particularly in the case of acids, that the net result is a great acceleration of the change as compared with the effect of heat on a plain solution of urea. Alcohol, on the other hand, promotes the first stage, but retards the second, i.e., the true hydrolysis stage. The retarding effect on the second stage is greater than the promoting effect on the first stage, and hence a retardation of the decomposition of urea is the result in the presence of alcohols. Is there any reason to suspect that the mechanism of the decomposition of urea by urease, so far as the purely chemical part of the change is concerned, is essentially different from that of its decomposition in the presence of acids, and of alkalis respectively?

One of the most notable features of enzyme action is the low temperature at which a change is effected with much velocity, as compared with the conditions required to effect a similar change by artificial means. For reasons which have been fully emphasized, this feature is more remark-

able in the special case of urease, than with other enzymes.¹

Now, there is no doubt that urease attacks "free" urea only, and it has been proved by the writer that dissociation into ammonia and cyanic acid is the first step in all the decompositions of urea in this condition.

Can urease initiate this dissociation as the first step in the "hydrolysis" of urea?

A comprehensive study of the urea/urease system has been recently carried out by Fearon (1921), on the basis of the cyclic formula of urea. The interesting results obtained have given a convincing answer in the affirmative to the above question. The following facts have been experimentally proved:—

1. Cyanic acid has been isolated, as the silver salt, during the zymolysis of urea by urease in aqueous solution.

2. The concentration of cyanic acid was found to rise to a maximum, after which it remained constant during the greater part of the reaction. Thus showing that it was being continually produced as fast as it was removed by hydrolysis.

3. Biuret was formed during the decomposition. This, the writer has shown, could only arise from an interaction of cyanic acid and unchanged urea.

4. Urease was found to attack urea in the presence of absolute alcohol, or, at all events, in a liquid containing not more than 0.82 per cent. of water. Under this condition there could be no hydrolysis. Ethyl allophanate, urethane, and biuret were the products formed, thus proving the formation of cyanic acid.

5. Urease was found to be capable of combining with ammonia, and of adsorbing urea.

The mechanism of the reaction is explained by Fearon thus: Urease condenses urea by adsorption on its surface. This is followed by the dissociation of the urea into ammonia, which combines with the enzyme, and cyanic acid which is hydrolysed by the solvent, in the case of water.

¹ Whilst the disaccharides are hydrolysed at the ordinary temperature by their special enzymes, this change can be demonstrated by the aid of acids under like condition, again, the action of lipoclastic enzymes in hydrolysing fats, is a change which can be effected by the aid of alkalis at room temperature. This is not so with urea; it is not "hydrolysed" by acids nor by alkalis at a low temperature.

It is suggested that dissociation of urea may be brought about by (1) Pressure in the adsorption area; (2) Temperature of adsorption; (3) Effect of an electric surface field, since urease has been found to carry an electro negative charge, and to combine with ammonia.

Apart from any theory of the mode of action of the enzyme in the first step of the change, the outstanding result of Fearon's researches proves, that *urease is not directly concerned in the "hydrolysis" of urea at all*. The function of the enzyme is to bring about dissociation of urea into ammonia and cyanic acid. The hydrolysis of the latter follows as a secondary change in the presence of water.

The theory that urease acts as a dissociating agent in attacking urea offers a new conception of enzyme action which it is not unlikely may be applied to other cases.

We have in this theory a rational explanation of the specific action of urease. It was pointed out that methyl- and ethylureas require a higher temperature than urea for their dissociation, and hence the velocity of their "hydrolysis" when heated in the presence of acids and alkalis respectively is much slower than in the case of urea under similar conditions. Now, no enzyme has been found to exert its activity above 80°, whilst many are inactive at about 70°, hence if the enzyme cannot bring about the dissociation of a substituted urea, below 80° say, the latter cannot be "hydrolysed." Fearon (1921) has shown that whilst methylurea is not attacked by urease up to the limit temperature (80°C.), ethylurea is attacked slowly by the enzyme at 70°, whilst normal butylurea—less stable than ethylurea, but more stable than urea—is decomposed by the enzyme at about 45°. These interesting facts lend strong support to the new theory, since they go to prove that if dissociation of a substituted urea is possible below the temperature limit of the enzyme's activity, then such a urea can be decomposed. The results are, in fact, predicted by the theory.

The decomposition of urea by urease is a further example of a reaction in the chemistry of urea, the interpretation of which has been greatly helped by a recognition of the cyclic formula, $\text{HN}:\text{C} \begin{array}{c} \text{Mx3} \\ \text{I} \\ \text{O} \end{array}$ proposed by the writer (1913-'14) to represent the structure by the urea molecule in the free state.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

A Manual of Surgical Anatomy. By C. R. WHITTAKER. Third Edition. Pp. 429. E. & S. Livingstone. Edin., 1921.

THE arrival of a third edition of this volume will be welcomed by students to whom it requires little introduction.

The book is concisely written and easy to read. On the whole, only material with a direct bearing on surgery is introduced. It is well illustrated with radiograms and diagrams, the latter being particularly useful. Several new illustrations are contained in this edition.

The old and B.N.A. terminologies are used in the text, the latter being usually given in brackets. As students now learn one or other terminology this is necessary, but at times the author uses both indiscriminately, which would require his reader to understand both methods of description.

The book is presented as "an outline to be filled in by the study of larger works, attendance at lectures, and, above all, by diligent work in the dissecting room," but its 400 odd pages supply the candidate for a surgery examination with a reliable method of revising his anatomy. A. B. C.

The American Year-Book of Anaesthesia and Analgesia. 1917-1918. Pp. 483+xxi. Edited by F. H. McMICHAN, A.M., M.D. Surgery Publishing Co., New York.

THIS book contains reports on many advances in anaesthesia and analgesia, and while the papers are mostly by American anaesthetists many come from other sources.

The physio-pathology of ethyl chlorid is treated very fully by E. H. Embley, of Melbourne. Working on morphinised dogs, he came to the following conclusions:—

(1) Ethyl chlorid, when used in excessive concentration, can cause syncope by stimulation of the vagus.

(2) It has a direct depressant effect on the cardiac muscles as shown by a gradual fall in blood pressure, pallor and diminishing pulse volume. These symptoms afford plenty of time for warning.

(3) Taking the depressant effect on the heart as a basis, the toxicity of ethyl chlorid is 1-19 that of chloroform. But as ethyl chlorid is used clinically 10 to 20 times more concentrated than chloroform, this advantage ceases to have

any value. Moreover, in such concentration syncope is more likely to occur than with chloroform. This would make the drug the more toxic, but for the fact that syncope sets in before the depression commences, the animal's heart recovering in all cases. We do not know how this would apply to an unsound human heart.

(4) Failure of respiration may be due to cardiac inhibition or to paralysis of the respiration centre from prolonged use of the drug.

(5) Ethyl chlorid is not as safe as ether, being 50 per cent. more toxic to the heart, and being more likely to cause cardiac inhibition and syncope.

Other subjects of interest to both surgeon and anaesthetist include: anaesthesia on epileptic, tubercular and cardiac cases; blood changes and circulatory disturbances under anaesthesia, and local and regional anaesthesia in general surgery and the specialities. The uses of magnesium sulphate in anaesthetics are mentioned. We are glad to see that the importance of blood pressure tracings is recognised.

An index of the current literature of anaesthesia is appended.

A. B. C.

Medical Conduct and Practice: A Guide to the Ethics of Medicine. By W. G. AITHESON ROBERTSON, M.D., D.Sc., etc. Pub.: A. and C. Black, Ltd. 1921.

THIS little book of 168 pages is written with the object of affording guidance to the young practitioner in the subject of Medical Ethics. It deals with most of the problems which confront a beginner and which often loom larger on his horizon than the question of medical knowledge. It deals with a variety of subjects, and includes chapters on "Commencing Practice," "Success in Practice," "Evidence in Courts of Law," "Certificates."

Unfortunately the requisites for success in practice are not to be acquired from a book. Much of the author's advice will only be appreciated after and inculcated by prolonged personal experience. Moreover, there are few subjects on which it is so futile to dogmatise as the essentials for success in the practice of medicine. Nevertheless, one cannot but admire the standpoint taken by the author in this book and the spirit of the advice given.

It should be in the hands of every newly-qualified practitioner who, by diligently reading it, will save himself much heart-burning and self-reproach. It is clearly written and is a credit to both author and publishers. L. A.

Pasteur: The History of a Mind. By EMILE DUCLAUX, late Member of the Institute of France, Professor at the Sorbonne and Director of the Pasteur Institute. Translated by Erwin F. Smith and Florence Hedges, Pathologists of the U.S. Department of Agriculture. Illustrated. Philadelphia and London: W. B. Saunders Company. 1920. Royal 8vo. Pp. xxxii. + 363.

THIS work is not only a biography of a master and friend, but also a history of a wonderful series of investigations and discoveries which did much to revolutionise modern Medicine.

The "Introduction" to the volume is the life-history in turn of the author of the biography of Pasteur—Emile Duclaux. It will be read with interest and pleasure. It is the work of the pen of the senior translator, Mr. Erwin F. Smith, who writes:—"One would like to know more about such a man, and Madame Duclaux, in her interesting book, *La Vie d'Emile Duclaux*, has opened the way. In the spirit of her happy motto, *Transire benefaciendo*, and mostly from this heart-book, I have compiled the following facts respecting the author of *Pasteur: Histoire d'un Esprit*."

Duclaux's work itself, as has been stated, is much more than a mere biography of Pasteur. It is a record of scientific advance in chemical and pathological biology. It is divided into eight "Parts," of which the chronology refers rather to the researches than to the life of the distinguished scientist who took such a leading and active part in relation to them. In successive sections the subjects of crystallography, lactic and alcoholic fermentations, spontaneous generation, wines and vinegars, the diseases of silk-worms, studies on beer, the ætiology of microbial diseases, viruses and vaccines, are described and discussed.

An annotated list of persons mentioned in this book will be found very useful for reference.

Taken as a whole, the work may well be regarded as a classical and most valuable contribution to scientific medicine.

J. W. M.

ABSTRACTS OF CURRENT LITERATURE.

MEDICINE.

L. MARCHAND: *Pathogenesis of General Paralysis of the Insane.*
"Presse Médicale," 31 August, 1921.

THE evidence in favour of General Paralysis of the Insane being of syphilitic origin rests mainly on the grounds that (1) *Treponema pallidum* has been found in the brain, (2) the cerebro-spinal fluid gives a positive Wassermann reaction. If the disease is of syphilitic origin why does no improvement follow the injection of arsenical preparations? Three explanations are offered:—

(1) The arsenic cannot get into the cerebro-spinal fluid.

(2) The arsenic has no effect on the *treponema* when it is in the brain substance.

(3) The nerve cells have been already permanently damaged.

(1) and (2) are disproved because a gumma of the brain is cured by 606. The occurrence of marked remissions in G.P.I. renders (3) unlikely. Therefore there is no adequate explanation of the inefficiency of 606 in G.P.I., except that the latter is not really due to *Treponema pallidum*. *Treponema pallidum* has been found in the brain, but only in a certain percentage of cases of G.P.I. A positive Wassermann reaction does not infallibly indicate syphilis, other conditions may show a positive reaction. Many cases of G.P.I. deny previous venereal disease and have never shown any cutaneous or visceral lesion. Influenza is probably due to a filterable virus though Pfeiffer's bacillus is usually also present. In the same way G.P.I. is probably due to a filterable virus though *Treponema pallidum* is often also present.

Such are the author's views on the subject, ingenious but not convincing.

V. M. SYNGE.

JULES BORDET: *The Present Views on Anaphylaxis.* "Johns Hopkins Hospital Bulletin," August, 1921.

WHAT are the symptoms of anaphylaxis? When a sensitised guinea-pig receives the test injection, within one or two minutes it begins to be excited, scratches itself, jumps convulsively, coughs; then staggers and finally falls over, showing extreme dyspnoea. the symptoms are those of asphyxia. At the autopsy a dominant pathological finding is the inflated condition of the lungs, due to a contraction, peripheral in origin, of the smooth muscle of the bronchioles, the effect of which is that air can be admitted into the chest by violent inspiratory efforts, but cannot be expelled. There is a surprising persistence of the heart beat, especially of the auricles. There are often small hæmorrhages scattered through the tissues, due probably to lesions of the endothelium. Other

important features of the shock consist in a fall of blood pressure and temperature, a lowering of blood coagulability and a diminution in the number of circulating leucocytes and platelets. What is the origin of the anaphylactic poison? Bordet thinks that the toxic substance is derived from the serum or from the cellular protoplasm and not from the antigen. He found that fresh guinea-pig serum, when incubated even with traces of an emulsion of agar, is converted into a powerful anaphylatoxin. Normal serum, not treated with agar and injected in the same dose, produces no appreciable effect. No toxin is obtained when agar is mixed, not with fresh serum, but with serum previously heated to 55° C. But if anaphylatoxin be prepared by means of unheated serum and agar, it does not lose its toxicity when heated to 55°-60° C. The formation of anaphylatoxin does not depend upon any albuminous impurities in the agar, as it occurs also with purified agar containing no trace of nitrogen. Agar anaphylatoxin can be produced, not only *in vitro*, but also *in vivo*, simply by injecting intravenously into a guinea-pig a small amount of agar emulsion. If the guinea-pig receives agar in somewhat less than the lethal dose, it becomes capable after its recovery from the shock, of resisting a quantity of agar at least sufficient to kill an unprepared guinea-pig. No antibody is in question in the case of agar, but this is undoubtedly a case of antianaphylaxis. The blood of such animals *in vitro* is no longer capable of producing anaphylatoxin under the influence of agar. The conversion of serum into a toxin by the mere influence of agar has not been explained, but Bordet has discovered an unexpected and very striking fact.

V. M. SYNGE.

BROOKS, H. : *Syphilis of the Heart*. "American Journal of Syphilis." April, 1921.

BROOKS states that syphilis involves the heart with much greater frequency than is generally supposed, in both early and late stages of the disease. In a series of 50 consecutive autopsies in cases of undoubted syphilis, 47 showed unmistakable changes in the heart, and in more than half of these cases death had resulted from disease of the cardio-vascular system. Syphilis may involve the pericardium, the myocardium, or the endocardium, the most frequent lesions being myocardial, usually secondary to disease of the coronary arteries.

The signs and symptoms of syphilis of the heart are simply those resulting from the particular lesion present and often develop few or no definite clinical characteristics apart from their association with a history of infection, positive Wassermann reaction, and relief of symptoms and signs under specific treatment. Cardiac pain is more characteristic of syphilis of the heart than any other single cardiac sign or symptom.

In treatment two things must be considered: (1) the specific infection; (2) the cardiac defect. Treatment of (1) is of much greater importance than of (2). In acute cases mercury (preferably given intramuscularly) is to be relied upon. In chronic cases mercury and

potassium iodide should be used. Great caution should be exercised in the use of arsenical preparations, and they should never be given until after the patient has been receiving mercurial treatment for some time.

Prognosis depends chiefly upon the character of the treatment given, and upon the stage of the disease at which it is given. With early diagnosis and efficient treatment the prognosis is very good.

V. M. SYNGE.

KUNHARDT, J. C. G. and CHITRE G. D. 1. *An Experiment in the Eradication of Plague Infection carried out in the Poona and Adjacent Districts.* 2. *Further Experiments in Plague Prevention Carried out at Poona.* "Indian Journal of Medical Research," Vol. VIII., No. 3. January, 1921.

IN the first paper the authors describe the method which they advocate for the eradication, or at least the diminution, of plague in countries where it is endemic and also the failure of the method when it was tested. Since bubonic plague is dependent on and is perpetuated by epizootic plague in rats, its eradication depends entirely on the reduction in the rat population. It is impossible to destroy all the rats in a country, but the authors have discovered that, in the majority of villages and towns, infection in rats dies out completely in the off-season. In only a few are there sufficient susceptible rats to keep alive the infection from season to season. By taking into consideration the size of the town and the date of appearance of human cases they were able to predict, very successfully, whether the disease would be carried over to the next season or not in that place. They considered that a reduction of rat population in the places which they decided to be dangerous would probably greatly lessen the number of epidemics. Determined efforts were made in a number of towns, considered as dangerous, to exterminate rats but, in the opinion of the authors, the experiment was a failure as the proportion of these which did actually carry over was about normal. The failure is to be attributed, not to any fallacy in the authors hypothesis, which appears to be a distinct advance in anti-plague work, but to the method used to get rid of rats. It seems that it would be possible for those engaged in fighting plague to concentrate their attention on destroying the rats in a few places, judged to be possible sources of infection, instead of attempting to decrease the total number of rats in the whole country.

The second paper gives the detailed results of experiments made to determine the best rat poison. It was found that the phosphorus paste used in the first experiment was unsatisfactory—it was unpalatable, a considerable dose was necessary, and it was rather slow in action. The best of the poisons investigated was found to be barium carbonate in 3 grain doses. The vehicle was of great importance, since it was found that dough made from wheat was less attractive than that made from other grains, bajri and rice were particularly successful. The presence of sugar instead of increasing the attractiveness of the bait, greatly lessens it. The

baits finally recommended are pills made from 3 grains of barium carbonate and 12 grains of bajri dough.

The first of these papers would well repay study by those practising in countries where plague is endemic, and the second by those who realise not only the danger of rats, but also the destruction and loss occasioned by these pests.

REITH FRASER, A., and DUNCAN, A. G. B. : *A Possible Explanation of the Increased Incident and Early Onset of Neuro-Syphilis.* "The British Journal of Dermatology and Syphilis." July-September, 1921.

THE authors draw the following conclusion from their extensive experience and knowledge of this subject.

1. The responsibility for the increasing incidence of early neuro-syphilis rests with—

- (a) The tendency to treat primary syphilis en masse.
- (b) The method of working to a mechanical time-table.
- (c) The blindfold method of working for a serological rather than a clinical cure.
- (d) Failure to interpret pathological findings in the light of the clinical picture.
- (e) Losing sight of the importance of the central nervous system as regards the patient's future.
- (f) The tendency to under treat patients.

2. Modern early treatment fails in protecting the central nervous system by rapidly sterilising the general systemic system, and thus depriving the cerebro-spinal axis of its antibody supply. In addition the large doses of arsenobenzene employed tend to damage the central nervous system.

3. The possible damage to the cerebro-spinal axis resulting from the strain and anxiety of war must be kept in mind as a predisposing factor.

4. The nervous system is invaded coincident with the generalisation of the organism.

5. Nervous system involvement may be symptomatic or asymptomatic. In the absence of clinical signs a normal spinal fluid may indicate the successful overcoming of the organism by the nervous system or the failure of the nervous system to react. It may also suggest that the general systemic circulation has been successfully sterilised before the cerebro-spinal axis was invaded. A pathologic spinal fluid may indicate damage or protective reaction. In the absence of symptoms we cannot accurately interpret the finding.

6. For the security of the patient the early invasion of the cerebro-spinal axis should be taken for granted.

7. The occurrence of neuro-syphilis is influenced by (a) the patient's power of resistance, (b) the natural resistance of the central nervous system, and its inherent capacity for producing antibody, (c) the stage at which treatment is inaugurated, (d) the type of treatment employed, (e) the period over which treatment is carried out, and (f) the type of parasite responsible for the infection.

(8) Great importance is attached to the value of clinical acumen, observation and judgment. These should be correlated with careful interpretation of pathological findings.

(9) The importance of treating each particular case on its merits instead of treating him as one of a series is emphasised.

10. Treatment should aim at conserving sufficient antibody for the requirements and protection of the cerebro-spinal axis, instead of defeating one's object by rapid sterilisation of the general systemic system, thereby leaving the nervous system to look after itself—a thing for which it is ill-equipped.

11. Antibody supply should be conserved over a period of years.
G. P. M.

LACY, G. R., and HAYTHORN, S. R.: *Viability of the Spirochete Pallida in Excised Tissue and Autopsy Material*. "The American Journal of Syphilis." July, 1921.

THE authors' interest in the occurrence of the Spirochete Pallida in dead tissue was aroused by finding actively motile spirochete in the blebs and organs of a still-born congenitally syphilitic infant which had been kept in the refrigerator twenty-six hours prior to autopsy. The organisms were so numerous in the serum from the lungs and the superficial blebs and were so actively motile that rabbits were inoculated intratesticularly and typical syphilitic lesions developed.

Several pieces of work on the viability of the spirochete pallida outside of the living tissue had already been done. Amongst the workers in this field were Gastou and Comandon who investigated the length of time that spirochete could be found on drinking glasses used by syphilitics at ordinary drinking fountains. Patients with mucous patches or chancres of the lip were selected as subjects and the glasses, after use, were dipped in water in the customary manner employed for washing such glasses at public houses. On examination it was found that the mouth secretions remaining on the glasses contained active spirochete as long as thirty minutes after inoculation. In present investigation the authors carried out a series of inoculation and microscopic experiments from which they draw the following summary.

"It is evident that the spirochete kept in serum or moist tissue, either human or animal, may retain slight motility as long as three months or more. Reliable dark-field examinations can be made on tissues or fluids collected several hours previously, provided they are kept moist and cool.

"Our work, which is in accord with that of Neisser, would indicate that complete drying is probably fatal to the Spirochete Pallida since each of our rabbits inoculated with dried spirochete on scapels, failed to develop syphilitic lesions.

"Spirochete pallida may, and in our case did, remain virulent in autopsy material for twenty-six hours or longer."

G. P. M.

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Original Communications.

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HYSTERIA.¹

ITS NATURE, DIAGNOSIS, PROGNOSIS AND
TREATMENT.

By A. BALDIE.

THE aim of this short paper will be to discuss briefly hysteria and its manifestations with a view to distinguishing it from other conditions with which it is apt to be confounded. The researches and conclusions of Babinski and Froment and others have helped to bring into relief a group of cases which can legitimately be termed Hysterics. As an alternative to the word Hysteria the term Pithiatism has been suggested. The characteristics of this group have been variously described as depending on "a weakening of the faculty of psychological synthesis" (Janet); "an exaggerated suggestibility" (Babinski); and even as on a congenital morbid mental state, on which the manifestations are imposed.

One of the definite advances is the exclusion from this group of cases hitherto considered hysterical, such as dermographism, and other abnormally intense and prolonged emotional reactions, such as tachycardia or over-activity of the sweat or intestinal glands.

¹Paper read to Members of Ministry of Pensions, Neurological Clinic, Dublin, November 7, 1921.

The Nature of Hysteria.

Before venturing explicitly to define hysteria, it will be wise to consider its psychological phenomena, and their relationship to the physical symptoms.

The two characteristics which strike one in approaching the typical hysteric are: (a) his apparent indifference, if not antagonism, to mental well-being and health; (b) his tendency to take the line of least resistance in dealing with his fellows. It is necessary to explain these if our psychotherapeutic treatment is to be scientific and useful.

We will first consider the apparent antipathy of the hysteric to any improvement in his condition. Rosanoff, in his "Manual of Psychiatry," has suggested that a salient element in the hysteric's condition is a *defect of character*. McDougall has pointed out that an essential condition of character is "the organisation of the sentiments in some harmonious system or hierarchy." This requires and depends upon the predominance of some vital sentiment which is capable of co-ordinating other sentiments and desires, and thus of acting as a mainspring of activity. This provides a clue to the mental processes upon which the exaggerated, or rather the disordered, suggestibility of the hysteric depends.

Two conditions may affect this question of character: (1) The individual may possess no vital or predominating sentiment: he may be the creature and the prey of diverse and antagonistic sentiments, each of which at different times affects his conduct. Thus an otherwise brilliant mentality may show *weakness* of character. (2) The sentiment which is raised to the level of predominance and supremacy may be morally and socially of little value to the individual and to the community. This is exemplified in the person who concentrates his energy in the indulgence of a false or unprofitable ruling passion, such as gambling. Here the desire to acquire wealth easily is given free play, and is uncontrolled by any demonstration of the risks of failure. So the gambling mind dwells in illusion, whereof the foundations are of chance.

So, in the case of the hysteric, there is an underlying idea or "ruling passion," which consistently governs conduct:

but this underlying idea is morally and socially of little worth. It represents the self-regarding sentiment exercised in a primitive and, perhaps, infantile, form. Its dominating mainspring is not activity, but inertia, not the enlargement of the sentiments and desires, but their restriction. In respect of this morbid inertia the hysteric is the antithesis of the non-moral man of ambition, or of the habitual criminal, the mentality of whom is also based on the indulgence of the self-regarding sentiment in an immoral manner.

We shall now consider the meaning of the term "suggestibility" before proceeding to show its application in the production of hysteria to the disordered mental state already described.

Suggestibility may be defined as "a state of mind resulting in the acceptance with conviction, in the absence of logically adequate grounds, of the suggested idea" (McDougall). The "absence of logically adequate grounds" is an essential condition, and it may be influenced, as implied by McDougall, to one or more of four causes: (1) Abnormal states of mind such as sleep, hypnosis, or fatigue; (2) deficiency of knowledge or convictions relating to the topic in regard to which the suggestion is made; and imperfect organisation of knowledge; (3) the impressive character of the source from which the suggestion emanates; (4) peculiarities of the character and native disposition of the subject. The suggestibility of the hysteric is demonstrably influenced by all of the above conditions.

Suggestibility may, therefore, be a normal and beneficial mechanism in all individuals. Its normality is well exemplified in children, in whom factors such as knowledge and experience are absent, of whom it is popularly said "they are easily lead," or of whom, in psychological parlance, we would say "they are hypersuggestible."

This hypersuggestibility is the basis of what has been termed the "Physiological Hysteria of Childhood." It is probably developmentally characteristic of a mind in which primitive emotional states are as yet "unsublimated" into the psychological "complexes" which form what are known as the sentiments.

It has to be remembered, in connection with the accept-

ance of a suggestion, that what to a normal individual are inadequate grounds, may be to an abnormal person not only adequate, but compelling. But suggestibility, abnormal as well as normal, is also governed by the conditions described above—*i.e.*, knowledge, experience, convictions, prestige of the communicator, disposition and mental state of the subject, such as hypnosis, sleep, or fatigue. In addition to these, it is governed by the emotional state of the subject.

The acceptance, then, of a suggestion by an hysteric depends upon its altered relative value to his psychical system, as compared with that of a normal individual. His restricted sentiments and, consequently, defective judgment, are the outstanding factors determining the acceptance or rejection of external suggestions.

We thus return to the proposition that the disordered suggestibility is based upon a defect of character, marked by an alteration in social and moral values resulting from an absence, or inhibition, of sentiments and emotions which normally are beneficial to the individual and the community.

If this analysis is correct, then the phenomena such as paralysis, seizures, gastropathies, etc., are to be regarded as rationalisations, and a logical outcome of an inert personality. The sympathy normally extended by humanity to the halt, the maimed, and the blind, acts on a person of hysterical type as a powerful suggestive influence. This is in harmony with the general experience that symptoms develop prolifically in environments such as hospitals and medical and surgical clinics; and in homes where the patients are surrounded by the solicitous and over-anxious attentions of relatives and friends. This is not to say, of course, that the physical phenomena of the hysteric are consciously developed. On the contrary, they appear to him probably as logical and incontrovertible as the rationalisations of our own emotions and beliefs appear to ourselves. These rationalisations are strictly defensive and protective in purpose.

This theory of the origin of hysteria is largely supported by evidence obtained in the recent war and after earthquakes and volcanic eruptions, etc. There the symptoms did not develop at the time of the psychic trauma, but subsequently.

The primary effect in such cases was a mental conflict, followed by a state of dissociation, due to fear.

We will define hysteria, then, as "a state of mind depending upon a restriction of sentiments and emotions, resulting in a moral perversion of the individual, due to a failure of adaptation to environment, and characterised objectively by the occurrence as rationalisations, of phenomena which are defensive or protective in origin."

It may be remarked that the objective phenomena show a tendency to disappear as they cease to be protective. Hence a certain lay assumption that the best cure for hysteria is a bucketful of cold water.

Considerations of space compel the omission of any attempt to define more closely those sentiments and desires the inhibition or absence of which serve to modify the personality of the hysteric. Nor can the attempt be made here to trace the relations of these to the basic instincts of self-preservation and sex. One would like, however, to throw out three suggestions for further discussion:—

(1) That the typical hysteric state is preceded by a history of excessive sexual repression or anæsthesia and is slowly and gradually evolved therefrom.

(2) That the production of hysteria through the stimulation of an excessive degree of emotion (fear) is confined to individuals described in (1).

(3) That the influence of such emotion on the normal individual is (a) to stimulate activity in the direction either of combat or of flight, and (b) to stimulate the *nisus generativus*.

Diagnosis.

The diagnosis of hysteria depends primarily on—

A. The presence of the philo-morbid syndrome already described—i.e., a defect of character connoted by the restriction of the sentiments and an antipathy to activity; and a disordered suggestibility based thereon.

B. The exclusion of any organic basis for the protean objective phenomena which may be encountered.

The mental state is at first sight one of *emotional instability*. The capacity for attention, perception, concentra-

tion and memory is not impaired to the extent often supposed. Thus the patient may appear fairly, or even averagely, intelligent. But the emotional reactions are, from a normal standpoint, exaggerated and perverted. These explain much of the irritation and annoyance experienced by those who have to deal with the hysterical patient. He may be not without a sense of humour; but it is a facile, restricted sense. He may see farce where others see only tragedy; and *vice versa*. Hence he may pass from giggles to tears in a manner most paradoxical to plain individuals. A patient was recently discovered, twenty minutes after the doctor had completed his examination, to be weeping copiously; it transpired that the investigation by means of a pin of her areas of anæsthesia had produced in her mind a state of acute self-pity and commiseration, and on being asked by a friend the cause of her sadness she dissolved forthwith into a flood of tears.

Differential Diagnosis.

The conditions with which hysteria may be confused or with which it may occur in association, may conveniently be divided into two groups:—

(1.) *Medical and Psychological*

An important distinction to be made is between hysteria and neurasthenia. By neurasthenia is meant the large group of psycho-neurotics whose condition is due to an abnormally intense or prolonged psychological conflict. The hysteric represents the type of psycho-neurotic who has solved his conflict, but solved it in the wrong way. Commonly speaking, he has thrown up the sponge.

At first sight the distinction is not easy, but after a careful investigation of the patient's mental state, past as well as present, it will not be difficult to decide, and to lay plans for treatment accordingly: it being in connection with treatment that the distinction is so important.

The presence or absence of *conflict* may be determined by the following tests:—

(a) The preoccupation of the neurasthenic with his *conflict* leads to a detachment from the external world, causing defective powers of attention and perception, concen-

tration, and *memory*. These are definitely affected, whereas in the case of the hysteric they are frequently normal, or nearly so.

(b) The *emotional* reactions of the neurasthenic may be exaggerated or repressed, but are never perverted. They are in *kind*, though not in degree, similar to those of normal individuals; and judged from our own emotional standpoint are rational. The emotional reactions of the hysteric, as already pointed out, are perverted, and his reactions, therefore, from a normal standpoint, are irrational.

(c) The absence of insomnia, or of any disordered action of the heart are in favour of hysteria, they being two symptoms invariably found in psycho-neurasthenia.

It has to be remembered that a condition of hysteria may supervene on a neurasthenic state. One of three things must happen to every case of psycho-neurotic conflict, or neurasthenia—

(1) The conflict may be resolved in favour of the higher levels of ideation, sentiments, character and conduct—*i.e.*, the individual reverts to a normal state.

(2) The conflict may become chronic in its duration and perspective, and by its excessive consumption of the individual's reserves of mental energy produce a state of melancholia and, ultimately, of melancholic dementia.

(3) The conflict may be resolved in favour of a low level of ideation, sentiment, character and conduct, and a condition of hysteria supervene.

But apart from functional nervous disease, a most common source of error of diagnosis relates to *organic nervous disease*.

It would appear that all *organic nervous disease*, like certain other conditions, tend to produce mental states resembling neurasthenia, or more commonly, hysteria. This is probably explicable by the gradual exhaustion and withdrawal of the stream of energy required for the healthy operation of the higher levels of mental activity, with a consequent regression to a lower level of character, at which the dependence rather than the independence of the individual is a condition of his survival.

Three conditions with which hysteria is apt, in our work,

to be confused, in their prodromal stages, are General Paralysis of the Insane, Locomotor Ataxia, and Disseminated Sclerosis.

In the case of G.P.I. and (though, probably, less frequently) of tabes, the apparently neurotic symptoms may precede any sign of gross intellectual derangement. The grandiose delusions of the general paralytic will, however, soon be apparent. Not so, frequently, in the depressed form; in which the mentality of the hysteric may be the only change apparent for a long period.

Not so long ago a case was seen of a patient who had remained in bed for months, "unable to work," and with no observable sign of disability except "the hysterical mentality." There was, however, a history of seizures, which, from the relatives' description, appeared to be hysterical. The case was admitted to hospital, and at the end of a month a great change was observed, which at first, it was assumed, denoted improvement. No physical sign of organic disease was discovered at the time. From being apathetic and passive, the patient became lively and extremely active and original. For about a month he remained the life and soul of the hospital, providing unlimited entertainment to patients and staff, but presenting no symptom which could be regarded as abnormal. Then one day was noticed a slight indistinctness of speech; and the other classical signs of general paralysis appeared successively and rapidly.

The mentality of a case of incipient disseminated sclerosis is very commonly hysterical. Here, however, it is apt from the beginning to be associated with one, or more than one, objective sign. So marked often is the mental "facility" in such patients that they are liable, especially when they exhibit the typical "staccato" utterance, to draw upon themselves the attentions of the police. One patient, a teetotaller, found himself under arrest on at least half-a-dozen occasions for drunkenness.

Certain of the classical signs and symptoms of organic nervous disease may be simulated by an hysteric. But their distinction is usually not difficult, having regard to the following points:—

(a) Their *atypical* character: if an hysteric is asked to place his feet together he will, in most cases, sway; though he will not, probably, fall. A good many normal persons may do the same thing. A true tabetic will probably sway, and fall, however widely based. In such cases the presence of the Argyll-Robertson pupil will be conclusive, though its absence will not necessarily be so.

Ankle clonus in the case of the hysteric is irregular in rhythm and tends to cease on resistance. The deep reflexes are all present and exaggerated.

Negatively, the apparent absence of superficial reflexes may be confusing. But the superficial reflexes are, in hysteria, more than usually susceptible to changes of temperature, etc. Patiently stimulated they can be induced.

(b) *The incongruity of the symptoms*; a pseudo-intention tremor may be associated with pseudo-Rombergism. The speech may be affected (atypically) with perfect integrity of the deep and superficial reflexes, and there may be ocular phenomena which will be of the nature of a blepharospasm. Nystagmus does not occur in hysteria.

(c) Their *variability and responsivity* to suggestion. The signs of organic nervous disease are occasionally variable; but they may be said to be totally unresponsive to suggestion: the hysterical imitation can be made to disappear, at least temporarily, by suggestion.

Delusions may occur, though infrequently. The delusions of the hysteric are often analogous to his objective manifestations—*i.e.*, they are rationalisations which serve to justify his failure to react successfully to environment. Thus a patient says he can never recover because the doctors are hypnotising him and putting pins into him. Another states he would not have fits were it not for some unseen agency which gives him fits.

Other medical conditions with which hysteria may be associated appertain to the alimentary tract. It is obvious that an hysterical gastropath, if his condition is prolonged, will develop organic pathological conditions through anorexia, ill-advised dieting, etc. These, nevertheless, from the point of view of treatment, cannot be separated from the psycho-neurotic state from which they have originated. In

such cases the determination of the primary cause may depend on a close investigation of the patient's mental and physical history.

Convulsive Seizures.—The commonest of these to be distinguished are epileptic automatism, epilepsy and Jacksonian epilepsy, the seizures of G.P.I., and of intra-cranial tumours; uræmic convulsions, alcoholic and other intoxications. Occasionally an acute fever may be ushered in by an epileptiform seizure.

The differential diagnosis between epilepsy and hystero-epilepsy may be a matter of difficulty when one is denied the privilege, as frequently happens, of seeing the patient when actually in a seizure. The following points may be of assistance:—

1. The mental and physical deterioration observed correspond in true epilepsy to the frequency, intensity and chronicity of the seizures. The true epileptic exhibits often a certain sanctimoniousness of character. He is, as it has well been said, “*religiose*” rather than religious. The so-called physical stigmata of epilepsy are strictly those of degeneracy rather than of epilepsy. They are usually absent in the case of hysteria.

2. No apparent exciting cause is necessary to precipitate an idiopathic seizure, whereas the hysterical fit usually has an emotional exciting cause.

3. The aura, auditory and visual sensations, and the epigastric sensation commonly met in cases of true epilepsy are absent in cases of hysteria.

4. The “*true*” epileptic seizure is frequently ushered in by the peculiar epileptic cry or moan: the hysteric usually screams or shouts.

5. The marks of injury frequently found in the case of chronic epileptics are not present in hysterics. An attack of hystero-epilepsy, is usually carefully staged, if not rehearsed.

6. During the actual seizure, the muscles of the hysteric may be contracted, and resistant, but there is no clonic stage, the movements being active and variable. The true epileptic exhibits, of course, the “*tonic*,” followed by the “*clonic*” stage.

7. Phenomena such as cyanosis, dilatation of pupils, blood-stained frothing at mouth, incontinence of bladder and rectum, are absent in hysterical seizures. The hysterical patient does not froth, though he may expectorate actively.

8. The coma which frequently follows an epileptic seizure is absent in the case of the hysteric, who may say that he "feels better" after his fit.

9. In hysterical seizures the reflexes remain unaltered; during the coma of true epilepsy reflexes may be temporarily abolished, then exaggerated. The plantar reflex may be extensor for a time.

Surgical Conditions—There remains the surgical conditions, which are of especial importance in our work, to which space, however, permits only a brief reference.

The seizures of "Jacksonian epilepsy" and those which may follow minor head injuries have to be considered, and are not always easy of distinction.

The commonest surgical conditions, however, from our point of view, are those of contractures and of paresis following gunshot wounds. The "true" hysterical conditions do not usually present much difficulty, but a condition which may still be met, though not so frequently as in the earlier years of and immediately following the war, is that described by Babinski and Froment as "Physio-pathic Reflex Paralysis." It is not psycho-genetic in origin, though it may be associated with a neurotic state. It is a partial paralysis following a trauma the degree of which has no apparent relation to the resulting paresis, which is usually *incomplete*: that is to say, that it may vary from slight weakness with little or no sign to complete loss of power, and marked wasting. The condition does not markedly yield to suggestion or psychotherapy. It may disappear after being present for months (and perhaps years), and the reason is not apparent.

Prognosis.

Hysteria is a moral mental state, and morals, as such, have, of course, no influence on longevity. But, as in other mental states, the process tends to become fixed and aggravated by time and circumstance, and the bed-ridden type may become so flabby and debilitated as to fall an easy

victim to pneumonia, or other acute condition.

The chief points bearing on prognosis are:—

(1) The prospects of cure are brightest in recent cases, and generally least in fixed and chronic cases.

(2) The less neurotic the type the better the prognosis. Many of the hysterics following catastrophes such as earthquakes, etc., develop in fairly normal persons; the condition being due to the intensity of the emotional ("conversion") trauma.

(3) Astonishing recoveries may occur without apparent cause in any case.

(4) Factors such as "Compensation," "Pension," etc., have an obvious bearing on prognosis. No less important are the material and moral influences on which the patient's mental attitude depends.

(5) Generally, given the necessary conditions for cure, the prognosis is good.

Treatment.

The *treatment* of hysteria is complicated, and depends upon the chronicity and intensity of the condition. It is easy, by taking advantage of the disordered suggestibility of the patient, to effect an apparent improvement by the removal of the objective phenomena. But to cure permanently the condition this method must be combined with others.

We may describe these briefly under two heads—(1) Physical, (2) Psychotherapeutic, and it will be wise to consider the psychotherapeutic aspect first.

Psychotherapeutic Treatment will depend upon an analysis of the mental condition in order to ascertain—(a) the nature and significance of the restricted sentiments and of their divorce from activity; (b) the *specific* psychic trauma or "convertor," which has produced the "conversion" state.

The stimulation and development of the inhibited, or absent sentiments and desires, and their conversion into habits of mental activity and of achievement is an essential condition of cure. This, it may be objected, is more easily said than done; but with patience, firmness, and understanding it has been and can be done. The relationship be-

tween the physician and the patient should depend upon respect rather than compulsory obedience. There should be a distinct economy of sympathy, but that is not to say that the patient is to be treated as if there were nothing wrong with him. On the contrary, he is allowed to understand that he is very ill indeed, but that cure is probable and easy of attainment, and that cure is *worth while*.

All but the slightest and most recent cases should be removed from the atmosphere of too sympathetic relatives or friends. The best environment is amongst healthy strangers fond of out-door life, games, exercise, and work. They should appreciate both the patient's condition and the contra-indication of expressed sympathy or pity; and also the necessity for discouraging the inertia and dependence of the hysteric and for encouraging his morale and independence.

Work, exercise and games are all useful. Work should be *congenial, voluntary and profitable*. Exercise should be contrived so as to prove pleasant. Games should be played, so far as the attendants are concerned, as with children, with moderation and restraint. There is no satisfaction, even in normal persons, to be derived from playing games with opponents who are so much one's superior as to make one's efforts appear futile and ridiculous.

All activity should be carefully graduated so as to accord with the patient's physical capacity. It has to be borne in mind that the physical condition of an hysteric is frequently flabby: what might be a pleasurable amount of effort to a normal person might be to the patient physically impossible, or disastrous if attempted.

As soon as he is physically capable of so doing, the patient should, to complete his cure, be made domestically, socially, and, ultimately, economically self-supporting.

His domestic self-reliance is to be inculcated by a definite understanding that he will himself perform the multifarious daily tasks upon which his personal needs and convenience depend. He should boil his own shaving water, make his own bed, help to sweep his ward or bedroom; and so on; nothing should be done for him which he can possibly do for himself. This will necessitate a very careful scrutiny of the day's possibilities, and very careful supervision; such

patients are usually past-masters in making work for other people. The patient's self-help should, at the same time, be contrived so as to be *purposeful*, pleasurable and not excessive. His social relationships will automatically readjust themselves. From being morbidly inert and apparently hypersuggestible he will begin to take a lively interest in his own and other people's doings. Improvement, once commenced, tends to be progressively rapid.

To be self-supporting, *economically*, is the final test and condition of cure. This can only be done, first, by means of workshops under the direct control of the physician; and second, by ensuring that the patient is resettled, after discharge from treatment, at employment of a kind which will enable his friends and relatives, as well as his physician, to control his further progress.

From the point of view of obtaining such an atmosphere as described above, marriage is contraindicated. For an hysteric to marry is in many cases to make worse his (or her) condition: to cure him would not necessarily improve a marital relationship founded upon the hysterical "psyche."

(b) The discovery and elevation into consciousness of the *specific* "convertor," or "conversion idea" is of particular value in the case of relatively normal persons whose condition dates from the exposure to some sudden and intense psychic trauma, such as hysteria following "shell shock" or "earthquake shock." It is, in the writer's opinion, of little value in cases of slow and gradual onset. The discovery of this "conversion idea" is to be achieved by means of intensive psycho-analysis.

(c) These foregoing methods have no relation, strictly speaking, to *suggestion*, the discussion of which has been purposely deferred in order first to consider clearly the significance, from a therapeutic standpoint, of the hysterical defect of character, and the implied dissociation, or perversion, of sentiments and desires.

But *suggestion* is of great importance, both generally and locally. Its general application should proceed on parallel lines with the methods outlined above. Its *local* value in the removal of the more spectacular phenomena is only apparently greater. The general treatment of the mental condi-

tion should, if anything, precede the treatment by suggestion of local symptoms. Otherwise the removal of one symptom may lead merely to its substitution by another "substitution neurosis." And the appearance of every new symptom acts harmfully on the hysterical mind and fixes still more definitely the morbid "conversion idea."

Finally, the treatment of the patient's physical condition must proceed on lines of general medicine. Medicinal treatment for purely functional symptoms is contraindicated and, by its suggestive effect, harmful. But where prolongation of the mental ill-health has brought about a sequence of organic disease, whether of gastric disorders or of gross muscular wasting from disuse, the application of the requisite medical or surgical measures is as necessary as in any other organic condition. Thus once more emerges the significance of the ancient dictum, "*Mens sana in corpore sano.*"

SOME EXPERIENCES IN VACCINE THERAPY.*

BY JOHN SPEARES.

MR. PRESIDENT AND GENTLEMEN,—Before entering upon the subject of my paper, I wish to thank the members of the Dublin University Biological Association for the honour they have conferred upon me in asking me to be their President for the ensuing year. It is an honour which I deeply appreciate, and I hope that during this session the Association—now almost 50 years established—will continue to be progressive, and to make further advances along the way of scientific knowledge.

I make no apology whatever for the subject of my paper. A great deal has been said of magnificent results from time to time by vaccine therapy. The results which I intend to put before you this evening are those only which I can vouch for; they are frankly disappointing to enthusiasts in many cases; they are frankly good in other cases, so I feel that the time is ripe to make a beginning and tell the truth about vaccine failures as well as of its successes. I have tried in this short paper to group the cases as far as possible.

Reaction to Vaccines.

The term *reaction* is applied to the local, focal or general response of the patient to inoculation. *Local reaction*—this is produced in the site where the vaccine is injected. In my experience the local reaction differs with the same strength of dose in different individuals; its intensity also varies greatly in the same individual. There is usually some slight swelling and tenderness which passes off in a few days. The site that I am in the habit of using is close to the deltoid or behind the shoulder, or below the clavicle. There is generally an unpleasant local reaction whenever the injection is made into the forearm. In one case inoculated with a stock staphylococcus vaccine the whole arm swelled, the glands in

* An Address delivered to the Dublin University Biological Association, November 5, 1921.

the axilla swelled, and for one or two anxious days I was in doubt whether incisions should be made in the arm. I believe that the vaccine I gave was not sterile, because I had boiled the needle and syringes myself for almost ten minutes; tincture of iodine was used to disinfect the skin in the usual way; however, the swelling went down in the course of a week; but I gave no more stock staphylococcus of that brand. Except for this I have never known of any unpleasant or untoward effects. *Focal reaction.*—By this is meant the effect of the vaccine on the supposed sites of infection. With autogenous staphylococcus vaccines I have noticed a marked focal reaction after the first dose in the great majority of cases.

In arthritis I have been told by patients that the pain was less. I have never seen any focal reaction in respiratory cases nor in cystitis, and am not certain of any alteration in the discharge from sinuses or wounds except those which I shall mention later on. While I do not think there is any great importance to be attached to focal reaction, yet it should always be looked for. *General reaction.*—I have had some cases who complained of slight headache, especially if the initial dose was large. With large doses of staphylococcic vaccine given at the first treatment I have seen mild rigors, nausea, a slight pyrexia in two cases. With bacillus coli vaccine I have usually had some general reaction as well as local. One case of endocarditis had to cease vaccine treatment owing to reaction, as I shall mention later.

Diseases of the Upper Respiratory Tract.

In connection with this side of the question, I have good reports to make. The chief credit is due undoubtedly to my kind friends, the nose and throat specialists, who have sent me the cases, and in particular have taken the material for examination and preparation of vaccines under the most ideal circumstances.

I have seen in the main two distinct contents of antrums—one, a thick yellowish mucous material and the other a straightforward pus. I will take those cases in which an antrum was concerned first:—

1. A lady had suffered from a right-sided facial neuralgia for years; she then developed some catarrh. The right antrum was punctured and pure pus flowed out from the canula. The culture was pure pneumococcus. I do not know of what group. A vaccine was made, strength 300 mil. per c.c.—10 injections from 2 min. to 1 c.c. at the usual intervals. Result—antrum quite clear, no discharge, no neuralgia. This patient was also treated by irrigation.

2. A young man whose right antrum gave pure pus on puncture. No bacteria were found in the films, culture gave a small bacillus like that of influenza, and pneumococcus. Dose from 3 min. up to 17 min.—6 doses. Strength of vaccine about 200 mil. pneumococci and 200 mil. of the bacillus. Result—complete failure; no change in the patient's condition; no local effect. A radical antrum operation had to be performed which completely cured him.

3. A lady—marked frontal headache, chronic case; thick pus in left antrum. Streptococci and *B. catarrhalis* seen in the films and streptococci and staphylococci and *B. catarrhalis* isolated. Mixed vaccine and *B. catarrhalis* prepared direct from plate; approximate strength 400 mil. per c.c.—11 doses given up to 16 min. This case gradually cleared up and sinuses became quite clear.

4. A student—acute pain (post-influenzal) in right antrum. Puncture gave a clear fluid with slightly yellow mucus through it. No bacteria seen in films. Culture gave a streptococcus and a member of catarrhalis group. Five injections of a mixed vaccine—total strength 300 mil. per c.c.—last dose 10 min.; result good—no discharge and no headaches.

5. Frontal sinus infection—long history of sinus discharging yellow pus for almost two years. *B. coli* found in the discharge. This lady had a sinus operation performed on her, and the condition had failed to clear up. I gave her several injections with practically no effect. A second operation was performed and piece of dead bone removed. The condition then cleared up completely in about a month with no further doses of vaccine.

6. The next case was an elderly man who for years had had a cough and a chronic antrum. Streptococci and

catarrhalis were seen in the film and cultured and a vaccine made—strength 300 mil.—dose from 2 min. to 12 min. was given. His antrum improved, his cough improved, but he never got quite clear. He was x-rayed, and had a mediastinal shadow of sorts. Two further vaccines were made with the same content and no marked results. A fourth vaccine was tried at his own request, which contained streptococci, pneumococci, catarrhalis, a gram-negative bacillus—mixed strength 400 mil. per c.c. in gradual increasing doses up to 16 min. Result—improvement.

The following four cases are those of pure nasal catarrh:—

1. Chronic case, organism, catarrhalis, excellent result, no other treatment given. This patient has now been free for the past year. Twelve doses were given, the last one being 200 mil.

2. A lady, age unknown, had constant nasal catarrh, conjunctivitis, and had periodic attacks like hay fever with persistent sneezing. She received eight injections of catarrhalis, pneumococcus and staphylococcus, last dose 400 mil. A very good result. All colds gone; no more sneezing; patient happy.

3. A lady who was told by an ear specialist that she would be totally deaf in two years. She had constant nasal colds. A hæmolysing staphylococcus was isolated—the result, I am told, is she has no further colds; she is greatly improved and quite content. I do not know what the last dose was in this case.

4. A lady suffering from chronic nasal catarrh and deafness. Staphylococci, pneumococci and catarrhalis were isolated—strength 450 mil.; dose up to 1 c.c. Result—catarrh greatly improved; hearing improved.

Two cases showed practically no benefit.

The criticism which I would make of these results and cases is this—I think that acute cases clear up generally without vaccine. That chronic cases do well with a vaccine. In all the cases mentioned except two the injections were given by nose and throat surgeons. The results are what they have given me, and I accept their findings as satisfactory.

Diseases of the Lower Respiratory Tract.

During the examination of hundreds of swabs taken from the nasopharynx of healthy contact cases in army life I found the following organisms of common occurrence:—

1. Catarrhalis group.
2. Pneumococcus group.
3. Streptococcus group.
4. B. Septus group.
5. Staphylococcus group.

6. Some various bacilli of doubtful parentage. And I take it that some or perhaps all of these are present in each nasopharynx here to-night.

In one lot of 230 men examined I found two carriers of meningococcus.

The bacteria mentioned are also commonly present in the sputum from which vaccines for bronchial disorders are made. At first in making these vaccines I was accustomed to plate out the sputum on blood agar, incubate, and select such colonies from the resulting growth as I thought or had learned to be of importance. These colonies were sub-cultured, emulsions made and again mixed in proportions generally held to be correct, and given in weekly doses to the patient. Of the results of these vaccines I have little experience. Since 1914 I have made practically every vaccine for bronchial trouble direct from the initial plate; the sputum was fresh when cultured in most cases. At first the counting of the emulsion was done by means of the blood-film method of Sir Almroth Wright, then by opacity, and then by the direct method, using a counting stage. The question of the sterilisation of the vaccine may be an important one; I really do not know. The method which I used was the one I learned in Trinity College Laboratory—*i.e.*, killing the emulsion by heating at 60 degrees for one hour. There are other ways, such as using an antiseptic, as some workers state that heating a vaccine injures its antigen properties. The average initial dose used for treatment of chronic cases was 30 mil. of the mixed vaccine; the weekly increase, about the same amount; the number of doses 10 to 12.

For convenience, I shall, first of all, mention some cases

of recurrent bronchitis inoculated during 1919 and 1920. As a prophylactic measure I used four doses of 100, 150, 250, 500 millions of autogenous vaccine at first, and in 1920 three doses of 250, 500, 750 millions at weekly intervals.

Of those done in 1919 I kept in touch with ten, of whom seven were considerably benefited; three said they were the same as ever. There was nothing to account for this in the variety of the organisms used in each individual case, but I acknowledge that I did not try to find out the cause of each relapse. In 1920 I inoculated sixteen cases with the three-dose system, and had good reports from ten people, who are satisfied that they were benefited in comparison with their experiences of former years. The other six I have never seen since. To me it is a matter of doubt whether to use stock vaccine or autogenous for prophylaxis in these cases. Personally I have felt that I always caught my own colds from other people, and this line of argument favours the use of a stock vaccine with a possibly wider immunity. I am using at present a mixture of some stock streptococci, catarrhalis, pneumococci of Parke, Davis and Co., with the patients' own selection added, and hope to get better results.

I have notes on fifteen cases of chronic bronchitis treated only with vaccines. The average number of doses was twelve—six cases were improved, the cough got better and sputum was reduced. In four cases the patients felt a great deal better, but were still troubled with sputum and cough; in five cases there was no result whatever. Four of the six cases which were definitely improved were cases in which the chronic bronchial trouble seemed to be an aftermath of an influenzal attack.

I have tried vaccine treatment in five cases of asthma with marked benefit in one only, and he is a dispensary patient who had to resign his position as a chauffeur owing to asthma. He did not give any cutaneous reaction to horse serum nor to honey, but he commenced to improve directly when given an autogenous vaccine; although he has been free now for over seven months, I am not prepared to write him down as a cure. This man always had an arm reaction even after small doses of his vaccine, the bacterial contents of which were streptococci.

Two cases of bronchorrhea tried with vaccine repeatedly have not shown any result.

Cystitis.

The first case in which I commenced to take notes taught me a lesson—that is, that academic results are not necessarily in keeping with clinical findings.

I was asked to make a *B. coli* vaccine from a specimen of urine. The strength was 100 mil. per c.c., and the commencing dose 10 mil., to be increased gradually. I received fresh specimens of the urine every week to estimate the number of *B. coli* and duly record the hoped-for improvement. The *B. coli* count improved in the right direction, but the patient died—I was told—of heart trouble. I felt somewhat like the Irish physician who assured the jury at the inquest that the patient had died cured of the disease for which he was treating him.

I have given vaccines to nine cases of definite cystitis with *B. coli* present in the urine without any appreciable effect whatever. Seven of the vaccines were made from catheter specimens; four cases tested continued to pass *B. coli* when the cystitis had apparently cleared up with douches, etc. I have never given a bigger dose than 100 mil., but I have given as many as twenty doses to the same patient. I am also aware of three other cases in which the vaccine was not given by me—one of whom had *B. coli* abscesses in his testicles—and in none of these cases has there been any change according to the reports I have had, except in one instance. In this case the patient, an elderly man, had pus, blood cells, *B. coli*, and streptococci present in his urine. Two mixed vaccines of *B. coli*, 100 mil., and streptococci, 50 mil., were made for him, the dose to be gradually increased to 1 c.c. I had a very remarkable letter from the patient recently to say that he was quite well, so I have asked his doctor what he gave to cure him. I think myself that the patient succeeded in passing the gravel or stone, and thanked the vaccine.

I have also tried *B. coli* autogenous vaccines (two prepared from the urine and one from the stools) in three cases of frequency of micturition, where it was thought that the fre-

quency was due to a *B. coli* infection. I gave each person eight doses up to 100 mil. *B. coli* without any effect.

All these *B. coli* vaccines were grown on McConkey agar, sub-cultured on ordinary agar and emulsions heated to ensure sterility. Possibly unheated vaccines might be of service, but at any rate I have little confidence in *B. coli* prepared in the ordinary manner for infections of the urinary system.

Streptococcal Vaccines.

Dr. Mervyn Gordon classifies streptococci into three groups:—

1. *Streptococcus viridans*.
2. „ *fæcalis*.
3. „ *pyogenes* or *hæmolyticus*.

Of this third group two sub-groups must be considered:—

(a) A variety concerned with respiratory infection, puerperal sepsis and localised or general streptococcal infection, and (b) another variety with cases of scarlet fever. I have used two classes of streptococcus vaccines:—

1. Sensitized, and
2. Ordinary.

Sensitized vaccines are roughly prepared as follows:—An emulsion of the streptococcus is mixed with the corresponding streptococcus serum, the mixture is centrifuged and the serum got rid of by washing. There are some good features about a sensitized vaccine. Firstly, it is less toxic. Secondly, it is stated to cause immunity quicker. It is, of course, not as rapid in action as a pure anti-streptococcus serum, but its effects are more lasting. Thirdly, it may be given every day, and bigger doses may be given than of an ordinary streptococcus vaccine.

My experience is confined to four cases of erysipelas, and I have notes of only three cases of streptococcal wound infection and one case of a low grade streptococcal infection in the back of the hand. The vaccine used was supplied to me by the Milbank Laboratory, London. Three of the cases of erysipelas had drastic falls in temperature after an initial dose of 200 mil., and did very well; they had no further marked pyrexia, and I know that

the surgeon in charge was greatly pleased with the rate at which the local conditions cleared up. The fourth case did not seem to respond to three doses up to 500 mil., but kept running a high temperature until it was found that he had a very large abscess in the left axilla, and when this was evacuated he did very well without further vaccine treatment.

Of the three cases of streptococcus wound infection one was an external wound in the upper portion of the right forearm; there had been a spreading cellulitis right down to the finger tips; five incisions for drainage purposes had been made at different intervals, and the case was in its fifth week when sensitized streptococcus vaccine was commenced. Seven injections were given at two days' interval, the dose going up to 1,000 mil. and the arm cleared up inside three weeks from the date of commencement of vaccine treatment.

The other two cases were shell wounds which healed under various treatments, including sensitized vaccines; the surgeons in charge expressed their approval, but one could not state that the improvement in either was due to the vaccine. The remaining case was a large, indolent sore on the back of the hand of a young girl which had resisted local treatment for some months. This girl was given six injections up to 500 mil. of the sensitized streptococcus, and the results were splendid; the ulcer healed, the local inflammation disappeared, and except for a bluish colour the hand was quite normal in four weeks.

I can only say with regard to sensitized vaccines that if I could get them I would use them on every streptococcal case except where serum is indicated. As for ordinary streptococcal vaccines I am unable to give you many results, as I have no details of most of the cases.

I have notes on three cases:—

1. Was a lady whose knee-joint had been excised, and when I saw her she had several discharging sinuses at the knee and hip. The surgeon in charge was quite satisfied with the drainage, but the question was, should the leg be removed or not? He was willing to try vaccine treatment. A mixed vaccine of streptococcus pyogenes and staphylococcus was made from the discharge; twelve injections were

given at weekly intervals. The sinuses closed and discharge stopped after five injections, and the lady went home with her leg. In this case both the doctor in charge and myself were convinced that the vaccine had achieved some definite result.

I have isolated a streptococcus from the blood in seven cases of endocarditis, and made vaccines for four of the cases. All four cases ended fatally; I do not think that the inoculations had the slightest effect, perhaps they were not pushed sufficiently, as the highest dose was 200 mil. One of the cases had only three injections ending at 50 mil., as a sharp general reaction seemed to occur after or coincide with the injection of the vaccine.

Pyorrhœa.

There is a considerable difference of opinion about cases of this nature. I have made a number of vaccines for these conditions for others, and I do not know what the results were. I have treated 19 personally. I propose to mention two classes of cases:—

1. In which there is mild pyorrhœa.
2. Cases of advanced pyorrhœa.

In the first group 12 out of my 19 cases belonged to this group. Direct swabs in eight of them showed numbers of the organisms stated to be causative of the condition known as Vincent's angina. This is extraordinarily common; it is, I believe, a common precursor of pyorrhœa. If it is not noticed and treated, I think even ordinary dental treatment—not to mention vaccines—will be of little avail.

To give an example. On the 20th of October I showed a case to the students of the Adelaide Hospital of a man who had a chronic cough, swollen glands in the neck, and very congested pharynx and gums; his teeth looked perfect, but his gums bled easily; none of his teeth were carious, and he complained of pain and stiffness in moving his lower jaw. He was a definite case, as we proved by smear examination, of Vincent's angina, affecting both mouth and pharynx.

In this group I have always treated the cases first for Vincent's angina and afterwards with vaccines

Of the 12 cases 8 had quite satisfactory results, using pure streptococcal vaccine in 6 of them, and streptococci and pneumococci in the other 2. The additional treatment was with mouth washes. The remaining cases were treated both with autogenous streptococci vaccine—8 doses up to 10 mil. of strength 200 mil. per c.c.—highest dose given $\frac{1}{2}$ c.c. Result—no improvement. Two of these I then treated with stock paradental vaccine for two months. Result—no improvement. They were then sent to dentists, and I have not seen them since.

In the second group—of advanced pyorrhœa—the 7 cases were cases in which there was a considerable number of teeth affected, and pus could easily be expressed by pressing the gums. There was no difficulty in making an autogenous vaccine in any of them. All vaccines contained streptococci, but in no case did any improvement whatever take place. Two of them had all their teeth extracted later; one had the 3 offending teeth extracted, and another had 8 teeth out.

I have never seen any focal reaction nor marked general reaction in these cases, but I have always found a local reaction very definite, and the conclusion I have come to is this: First, it is necessary to find out if Vincent's organisms are present in pathological numbers or not. If present treat the condition with N.A.B. and glycerine. Secondly, vaccine treatment of advanced cases, trying to save teeth is, I think, waste of time. One of the cases in which extraction was performed developed pneumonia after extraction, and there were streptococci and pneumococci in the sputum.

Infective Arthritis.

The connection between focal infection and arthritis has suffered from enthusiasm. "Post hoc propter hoc" is not always a safe logical method. Why should one patient with a focal infection develop arthritis and another with an equal heavy focal infection not do so? Pyorrhœa and arthritis are closely connected in our medical thoughts, but are we paying sufficient attention to the extraordinary number of cases of pyorrhœa where there is no arthritis? Why is there a dispo-

sition to it on the one hand and an immunity on the other? Again, some cases of arthritis tend to recovery with more or less deformity and loss of function in contrast with others where treatment of every kind give no help. It is also an entertaining problem to determine why it is that a succession of boils does not give a sufferer any immunity, although we recognise that his general health suffers through toxic absorption presumably from these boils. Those of us who have some carious teeth may well wonder whether we are not conferring on ourselves from day to day some little immunity and keeping down our dentist's bills.

The term *infective arthritis*, is used in a wide sense, and I propose to mention first of all cases of the so-called rheumatoid arthritis type. The causative agent in this condition is supposed to be some sort of streptococcus, and the actual source of infection to be the teeth, tonsils, appendix, or other portion of the body. If the condition is caused by a streptococcus, then it must be granted that the organism is one of much less virulence than that which we usually call a streptococcus. The procedure adopted in every case was to take cultures from the teeth, tonsils, fæces and urine. The first case that I treated gave me a great impetus to go on with this line of treatment. He was a man aged 40, who had arthritis in his wrists for two years; there was thickening present around both wrist joints; he had occasional exacerbations, and had been vigorously treated by local medication. From his throat culture I got a practically pure plate of a streptococcus; from the urine, etc., nil. I gave him 10 injections, varying from 20 mil. to 300 mil., and the result was most satisfactory. During the last two years he has resumed his golf and has had no attacks.

The rest of the cases I have treated include cases which showed much more advanced trophic changes, degenerative changes and contractions. They may be divided up into two groups:—

Group 1.—Cases in which a satisfactory focus of infection was found.

Group 2.—Cases in which no focus was found.

In Group 1, I treated 12 cases—5 males and 7 females—all

over 40 years of age; duration of disease, 5 to 20 years; average, 12 years. In 5 of these cases I made cultures from the stumps of extracted teeth; in 10 of them I found streptococci; in one a pure pneumococcus, and in one nothing. I could never satisfy myself that the courses of injections given in these 11 cases were of the slightest use focally; there seemed to me to be no change in the patients' condition, but severe reaction and increase of pain followed large injections of over 600 millions in 4 of them. A sense of well-being during the course of inoculations, possibly induced by them, was the only marked benefit I noticed. The doses given varied from 20 mil. to 400 mil., and the average number of doses was 14. Three of these patients seemed to improve when the vaccine course ceased.

In Group 2, I treated 10 cases where no satisfactory focus of infection was found—4 of these with a streptococcus vaccine made from the stool, and 6 with a vaccine made from tonsils, in no case obtaining a really genuine benefit. One example will probably be sufficient:—A lady, aged over 40, a teacher by profession, had chronic arthritis for some years with occasional severe exacerbations, especially during the summer months, always worse at night. Her wrists, left knee, and right ankle were affected. There was no definite focus of infection. I gave her (*a*) a streptococcus vaccine from stools, 12 doses up to 400 mil.—result, nil; exacerbations as before; (*b*) an autogenous *B. coli* vaccine, 6 doses up to 150 mil.—result, nil.

I treated three cases of fibrositis with vaccine as follows:—

1. A young lady—no definite focus found; throat culture streptococcus and pneumococcus, 10 doses, from 10 mil. to 150 mil.—result, good; no complaints for past 3 months.

2. No focus found—treated with phylacogen—no result, from 2-25 c.c. bottles; no improvement.

3. A lady, aged 29, who complained of pains in right shoulder, right side and in legs, and of a general feeling of stiffness—treated by a mixed streptococcus from stools—9 injections up to 250 mil.—result, good; considerable freedom from pain since October, 1920.

Vaccines should never be used as if they were the specific treatment for cases of arthritis. They have a limited value

—many of one's patients say that they feel better and may get some slight amelioration of symptoms whether coincident or not. I do not think we shall know more until much further and more accurate work has been done, as vaccines of shot-gun type do not lead us far in scientific knowledge.

My advice is to make use of other treatment as well, and remember the definition of a pessimist as one who wears both belt and braces.

Gonorrhœa.

Under this heading I propose to mention the two groups:—

1. Acute cases.
2. Chronic cases.

In the year 1917 to 1918 especially I had a good deal of experience of the difficulties encountered in growing the gonococcus. Besides those usual academic difficulties which are more pronounced than in culturing most organisms, there is also great trouble in getting an early case to culture which has not yet been treated. I have never yet seen a pure culture of gonococcus even from early untreated cases. There has always been a staphylococcus, a diphtheroid bacillus or a streptococcus present. For the past four years I have adopted the plan of adding stock gonococcus to an autogenous vaccine of the organism found in each patient for treatment purposes. I do not know of any better method than this, but again I must say that it is not a wise procedure, in my experience, to rely entirely on vaccines for treatment.

I have notes on 12 acute cases treated as above and 3 treated by detoxicated vaccine, as advertised by the Genatosan firm. Eight out of the 12 cases did well, but they were also treated locally; 2 developed pronounced prostatic infection, and are still on treatment with douches, etc.; 2 developed testicular swellings. As regards the detoxicated vaccines, though I have only used them in 3 cases, I have ceased trying them, as I do not think they are even as good as the ordinary vaccine. I will mention one case—a student who came to me after exposure, but before the typical discharge had commenced. I gave him detoxicated vaccine, and he shortly went over to London, and while there had full

courses of it. He remained away about 3 weeks, and two days after his return developed an abscess in his prostate. He had since improved under the usual routine treatment of occasional massage, etc.

In chronic gonorrhœa cases I have never been certain of improvement with any sort of vaccine. I have tried both autogenous and detoxicated vaccines in 21 cases, all males. The organisms generally present are diphtheroids, streptococci, or staphylococci. All these cases are generally hopeful and keen on treatment, and one case has had 47 injections in the past 11 months and is now commencing anew as he wishes to get married next summer.

On the other hand, in gonorrheal arthritis, I think an autogenous vaccine mixed with stock gonococcus gives excellent results. I have dealt with 5 cases, in which I had no hesitation in stating that they all appeared to benefit clinically from the use of vaccine. They were all treated for about 4 months—injections were only given once per week, and improvement both as regards pain and swelling was rapid and marked. Two of the cases were acute, one of them with his right knee joint swollen and very painful; this case remained in bed 4 weeks, had a mild pyrexia, and was treated first with stock gonococcus vaccine for an initial injection and then with the combined vaccine. Local treatment was also used, and this patient's knee now gives him very little trouble. I have only seen one precisely similar case which was under my care temporarily, that of a young lady three months married, who developed slight rigors, mild pyrexia. At first I thought she was suffering from a chill until on the third day pains and swelling in her right knee were sufficiently marked to arouse suspicion and lead to a true diagnosis. This case was treated locally and with stock gonococcal vaccine; she commenced to improve promptly after her initial dose, and I heard that the later results were quite good.

Staphylococcic Infections.

Autogenous staphylococcic vaccines are undoubtedly good for boils. One case I met which was resistant, and on which no vaccine, stock or otherwise, had the slightest

effect. This case cleared up with injections of Collosol Manganese. For the hard nodular swellings which are occasionally met with in people who suffer from boils and acne, I have never had a vaccine to produce any good result. I have tried 5 cases of this kind. Of pustular acne I have treated 9 cases with a staphylococcic infection; they all did well. I admit that local treatment had always been applied in every case, such as removing blackheads, but 5 cases had been treated by local methods without success before vaccine treatment was commenced.

I will mention one case. A young lady who was about to be married had an extraordinary type of pustular acne, particularly marked on the sides of the neck and chest; she had received a lot of local treatment, tonics, etc., without any improvement. This girl cleared up completely after 7 injections of autogenous staphylococcus. She got married all clear in 1916, and, as far as I am aware, has had no recurrence since; her highest dose was about 1,000 millions.

Staphylococcic Furunculosis.—I have treated 6 cases, all with good results and no recurrence, except in one case, and this case was given a second round of 10 doses last February and March with no recurrence since.

The question of the relationship of local sepsis to skin conditions is at present attracting attention particularly as to whether the toxic disturbances are due to anaphylaxis, the body being sensitized to the protein of the infecting bacteria, or whether they are due directly to the toxins developed by these bacteria. In view of the present interest on this subject—in conjunction with Dr. Wallace Beatty I made vaccines from scrapings of the head and from stool contents for cases of alopecia with no success; one of these patients was treated afterwards with stock acne and later by a vaccine made in the Trinity College Laboratory with no result. Two cases of chronic urticaria—in one of whom the skin condition appeared after operation for appendicitis—and who were quite resistant to several local treatments, were greatly improved after 12 and 14 doses respectively of vaccine prepared from autogenous *B. coli*, and streptococcus *fæcalis* from the stools. Of 3 cases of prurigo treated with intestinal vaccine—one, a young man who had had the

infection since childhood, was improved by the vaccine, in Dr. Beatty's opinion. The organisms used were *B. coli*, *Staphylococci* and *Streptococci faecalis*. Three cases of psoriasis were treated with a view to preventing recurrences without success. Two cases of dermatitis herpetiformis were also treated in the same way with no result. Both these patients had suffered from severe dysentery during the war and their skin troubles were a subsequent development.

These results are all I propose to mention, and I know that this short paper is necessarily disjointed. However, it is a small effort to collate some few facts, and, as it were, to take stock of results in order to determine what help vaccines are likely to give. As far as I am concerned, I believe there is a good reason to have some confidence in prophylactic vaccines, especially of the respiratory type. I think that cases of bronchial infection which will not respond to ordinary treatment should be tried with vaccines. I have no faith in *B. coli* vaccines for any condition. Arthritis cases may be temporarily pacified by vaccines, but most cases of chronic gonorrhœa remain indifferent.

We need help and direction from those expert bacteriologists who know the habits and customs of each organism, and who can make a vaccine that may, with safety, be given to a patient. who will advise the clinician as to the selection of suitable cases for treatment, and see the result of treatment from time to time.

A certain discredit has fallen upon vaccine therapeutics; perhaps it is wrong, perhaps it is right, but we cannot tell until we try, and until some definite research is undertaken on systematic lines, with the clinicians and the laboratory advisers working together on a group of cases, we shall never know where we are. The experiences of one single individual may help him, but the wider collated experience which would readily be gained by a little conjoint work in our Dublin hospitals would be of great benefit to medical men, especially in the treatment of such chronic conditions as arthritis.

We are all born probably sterile, and the struggle between the vegetable world and the animal world, the bacillus

versus man, makes one wonder if every infection is of saprophytic origin—if the pathogenic bacteria of to-day were mere saprophytes in their unfolded past, for in the words of Professor Boden—"Infectious disease would appear to us, whatever the age of the person may be, to be an accident; of the same nature, in short, as a traumatism of any kind which would clearly indicate a fracture or a dislocation. This is not the natural end of a human being, whatever his age may be; it is not by this means he must terminate his life. In a philosophical study M. Metchnikoff developed this idea, with his well-known talent, and he arrived at this conclusion—that normally human life would become more prolonged than it is, and would reach a period where death would appear a comparable necessity, such as the necessity for sleep after a tiring journey. Men would then disappear naturally like insects who only live a few hours and die normally without disease."

TWO INTERESTING CASES OF HEART DISEASE, WITH ELECTRO-CARDIOGRAMS.¹

By LEONARD ABRAHAMSON.

Case I.—*A Case of Mitral Disease with Auricular Flutter and 4:1 Heart Block.*

THE patient, B. C., aged eighteen, was admitted to Mercer's on the 10th of September. She was then in an almost moribund condition, and was suffering from extreme orthopnoea and considerable cyanosis. Her face was almost black, her pulse imperceptible. She presented a large ascites, which was immediately tapped, yielding on two occasions a total of fourteen pints of fluid. Pituitrin, alcohol, oxygen, were administered and, a cursory examination having revealed a cardiac lesion, she received digitalin and tincture of digitalis (min. 30). Some blood was drawn from a vein. The patient then rallied and progressed considerably under digitalis therapy, sod. sulphate each morning, and a dry, fairly salt-free diet. Under this régime she has warded off her ascites and is able to walk about without distress.

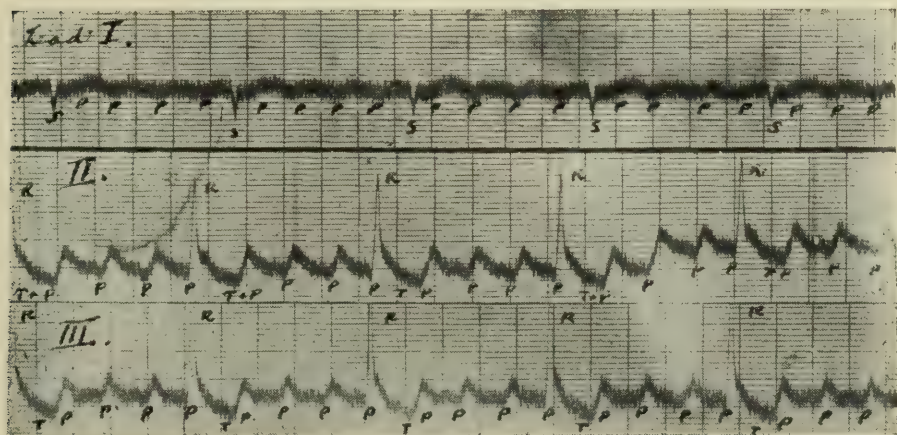
Previous History.—She has been ill since the age of four, having at this date developed acute rheumatism. Since then she has always suffered from breathlessness, swelling of the feet at times, and latterly ascites. Menstruation commenced only recently and is very scanty.

Present Condition.—The patient is decidedly undeveloped and looks like a child of thirteen or fourteen years of age. She has a reddish tint of cheeks, lips and nose-tip, and at times becomes markedly cyanosed. Her legs are bluish-black in colour. No œdema of ankles; some ascites; no dyspnoea at rest. General condition better than it has been for some years.

¹From the Electro-Cardiograph Department, Mercer's Hospital.

On examination.—Slight systolic venous pulsation in the neck; slight epigastric pulsation. Diffuse præcordial pulsation. Palpation reveals the presence of a marked thrill felt about the left nipple region, diastolic in time. Heart dulness is increased markedly to right and left. On auscultation, the first sound in the mitral area is short and sharp; the second sound at mitral and pulmonary areas reduplicated. There is a rasping diastolic murmur and a systolic murmur, the latter being conducted to the left. Both murmurs are best heard inside the left nipple.

The blood pressure (auscultation method) reads 105 systolic, 75 diastolic. The most interesting feature of the case lies in the pulse. This was found, shortly after admission, to be at the rate of 112 per minute. At the end of a few days, probably as a result of digitalis therapy, the pulse settled down to a rate of 64, which it has maintained ever since. It is perfectly regular and, as we found after the diagnosis of flutter was made, quite unchanged by exertion.



Case I.

The electro-cardiogram shows that although the ventricle (wave "R" or "S") is beating at the rate of 64 per minute, the auricle (wave "P") is beating four times as fast. There is perfect regularity of both. The auricular waves are most marked in leads II. and III. and are of constant form. The tracing, therefore, shows the presence of auricular flutter, the auricle beating at the rate of 256 times per minute, the ventricle beating at a quarter of this rate as the result of 4:1 heart-block.

The case demonstrates the fact that heart failure, in cases with a regular pulse, may be due to unrecognised flutter. It further shows the great efficacy, in this condition, of digitalis which, even in those cases which do not show resumption of normal rhythm, acts beneficially by increasing the heart-block, and reducing the rate of the ventricle.

Case II.—*Electro-Cardiograms of a Case of Auricular Fibrillation Treated by Quinidin Sulphate.*

Although this case was not cleared up by quinidin, we deem it of value to publish the tracings, as they help to elucidate the action of the drug on the heart-beat.

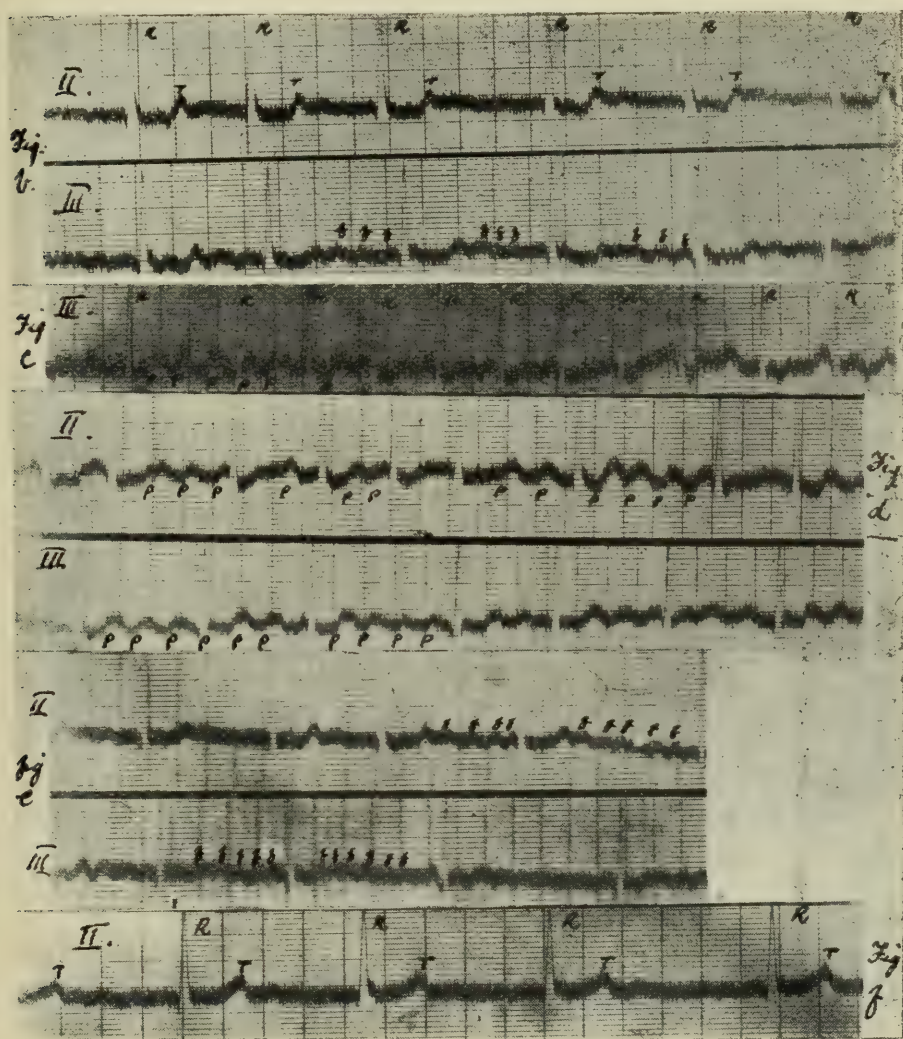
Patient C. S., aged 42, was admitted to Mercer's on the 13th October, 1921, complaining of breathlessness and inability to walk any distance.

He stated that at the age of 27 he developed acute rheumatism. He was well for nine years, when he became breathless on exertion. Later, he developed temporary swelling of the ankles, which lasted for a week. No other symptoms.

Examination revealed the presence of slight cyanosis. The patient was orthopnoëic. The apex beat was normal in position. On palpation, there was a slight thrill, diastolic in time, strictly limited to a small area over the apex beat. The cardiac dulness was normal. On auscultation, we heard a diastolic mitral murmur, also a systolic murmur heard in the pulmonary and mitral areas and conducted to the left axilla; an accentuated first mitral sound. There was no pulsation in the neck. The pulse was, on admission, feeble, absolutely irregular, and of a rate of 114 per minute. Under digitalis, the pulse rate was reduced to 70 per minute, whereupon digitalis was withdrawn, and replaced, after a few days, by quinidin sulphate.

The treatment was commenced on October 25th and terminated on October 31st. In all 63 grains of quinidin were administered, in doses of 3-6 grains, in capsules. The patient was somewhat intolerant and we were unable to push the drug any further.

The first electro-cardiogram (Fig. b) was taken before treatment. It shows the presence of auricular fibrillation, as evidenced by the absence of a "P" wave, the irregularity of the beats, and the presence of fibrillation oscillations f-f-f. It will be noted that these oscillations are very small and numerous and that the rate of the ventricle is 72 per minute, approximately.



Case II.

The second tracing (Fig. c) was taken on the 29th October, after the administration of 39 grains of the drug. It shows two phenomena of note:—(1) The oscillations of the auricle have become more marked and much less frequent. (2) The rate of the ventricle is much faster. It is now beating at a rate of 120 per minute.

The third tracing (Fig. d) was taken the following day, after administration of 45 grs. of the drug. It shows the presence of an irregular flutter. The auricle is beating in the region of 250 per minute. The ventricle is beating at the rate of 90, approximately.

The fourth and fifth (Figs. e and f) tracings demonstrate the return of fibrillation on withdrawal of the drug, the ventricle resuming its previous rate.

We would draw attention, in conclusion, to two points:—
(1) The slowing of the auricle, and the production of irregular flutter. (2) The quickening of the ventricle.

In view of the latter observation, which is dwelt on by many writers on the subject, it would seem inadvisable to give quinidin to patients with a fast pulse.

We are deeply indebted to Dr. Rowlette for kind permission to publish these cases, which were under his care.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

Psychology and Psychotherapy. By WILLIAM BROWN, M.A., M.D. (Oxon.); D.Sc. (Lond.). Edward Arnold, London. 1921. P. x. + 196.

THIS book is written by one who not only has had a large experience in civil and military practice, but also a deep knowledge of the subject as practised and taught by the leading psychologists. Freud takes place of honour as an authority, as is natural. Dr. Brown is not an absolute disciple of Freud, but takes his work as his standard, pointing out where and why he does not agree with Freud's theories.

By way of introduction Dr. Brown discusses briefly dissociation and the degrees thereof. He then discusses the theories advanced by Freud as regards dreams, the unconscious, psycho-analysis, hypnosis, etc. He also gives some physiological theories—principally McDougall's—with an interesting chapter on the theories of emotion.

In dealing with psychotherapy he describes the different methods and the factors operating therein. He has developed a method himself which he calls antognosis. This appears to have much in common with psycho-analysis as practised by Freud.

Dr. Brown connects up the lessons to be learnt from war—neuroses and applied to civil practice, showing how much there is in common between these neuroses developed under such different circumstances.

His final chapter on "The Relation of Mind to Brain" is very interesting, but somewhat beyond the scope of the book. He is a follower of Bergson. This chapter emphasises the one great difficulty in the book. As it is a small book, there is no room for wide argument, and so the beginner may find himself rather puzzled from time to time.

On the whole, Dr. Brown is to be congratulated on the completeness of his book. "Multum in parvo" might well be its title. It includes the work of many psychologists. It deals exclusively with the theories on which psychotherapy is based, and attempts nothing of the clinical side. Both

the student and the expert will find it interesting and of benefit. A couple of chapters may be found to be beyond the grasp of the student, but, on the other hand, the rest of the book contains, simply and concisely, the elements of psychology and psychotherapy.

GERALD J. MOORE.

Manual of Psychiatry. By AARON J. ROSANOFF. Chapman and Hall, Ltd., London, 1920.

THIS volume can be recommended to all who are interested in Psychiatry. It exemplifies the present tendency to co-ordinate the morphological and the psycho-pathological manifestations of nervous and mental disorders. The influence of such distinct factors as toxins (*i.e.*, syphilis, alcohol), degenerative changes, educational and environmental factors, etc., is considered throughout. The diagnosis and prognosis of nervous disorders is exhaustively discussed, showing the distinct advances which have been made as a result of the experience gained in the recent War.

Most of the literature on the subject is surveyed critically, but not unfairly.

The attempts to consider conditions such as dementia præcox and paranoia as of psychological origin are recognised, though the Editor seems to reject the theory in regard to these two conditions.

The net result is to present a clear and useful summary of the clinical types of mental disorder, and of the various methods for their treatment now in vogue.

One of the most significant features of the book is its emphasis of the importance of social and educational factors in the prevention and treatment of psycho-pathological conditions. A large part of the book is taken up by the statement of methods of psycho-analysis such as free association and for estimating the capacity of mental defectives.

A. B.

The Logic of the Unconscious Mind. By M. K. BRADLEY. Henry Frowde, Hodder & Stoughton, Oxford University Press, Warwick Square, London, E.C. 4.

THIS volume indicates briefly the modern tendencies in psychology. It is explanatory and illustrative, however, rather than technical in method. It may be recommended to those who have little time to delve deeply into the more scientific and abstruse tomes devoted to the subject. So used, it will be found instructive and interesting, bearing in mind the author's own statement in the Preface that the book purports to be a sketch, not a finished thesis. The illustrations and examples of mental processes such as rationalisations by reference to political and other events of contemporary life, whilst interesting, tend to be fallacious and the author's conclusions are apt to be disputed by people whose prejudices may be excited unconsciously by her examples. But it is very readable, and stimulating, as well as provocative.

A. B.

Gynæcological and Obstetrical Tuberculosis. By CHARLES C. NORRIS, M.D., Associate in Gynæcology, University of Pennsylvania School of Medicine. Chs. xv. 348 pages. D. Appleton and Co., New York and London.

THE author has studied the literature of his subject exhaustively. At the end of each chapter there are two or three pages of references which ought to prove extremely useful to anyone writing on the subject or interested in any special case.

There are chapters dealing with tuberculosis of the external genitalia, the vagina, the cervix, tubes, and ovaries, etc.

In discussing the question of pulmonary tuberculosis and operation, the author mentions three dangers.

1. The operation itself may cause spreading of the infection to unexpected parts or exacerbate the pulmonary process.

2. A general anæsthetic may light up the pulmonary lesion.

3. The patient has lessened resistance, and is therefore less able to withstand the dangers common to operation.

The last two chapters are devoted to tuberculosis of the breast and peritoneum.

A long table of differential diagnosis between tubercular,

gonococcal and streptococcal pelvic disease is given with reference to the peritoneum; primary tuberculosis is an extremely rare condition.

The author gives four chief ways by which infection of the peritoneum may occur.

1. By the blood or lymph channels.
2. From an intestinal lesion through the walls of the gut.
3. From a tuberculous mesenteric gland.
4. From tuberculous salpingitis.

In women the Fallopian tubes are the most frequent primary intra-peritoneal site; though the appendix and cæcum are not uncommon starting points.

A characteristic of tuberculous tubes is that the abdominal ostia tend to remain patulous, the ascitic variety being the most frequent form of tuberculous peritonitis.

Tubercle bacilli have been found in the placenta of tuberculous parturients by some observers in 40 per cent of cases—in the author's series in 5 per cent.

In cases where tubercle bacilli are present in the placenta it is only reasonable to suppose the decidua involved. If this be conceded, it is to be expected that every contraction of the uterus would force virulent organisms into the general circulation, which may start fresh lesions.

Von Bardeleben recommends Cæsarian section and excision of the placental site prior to the onset of labour, in order to prevent the pains squeezing out the organisms, and to remove the possibly infected placental site. The patient may be sterilised at the same time.

This book should prove generally useful, the references greatly adding to its value for those specially interested in this subject.

R. E. T.

The Psychology of Functional Neurosis. By H. L. HOLLINGWORTH. Publ.: D. Appleton and Co. New York and London. 1920. Sm. 8vo. Pp. xii. + 256.

AFTER dismissing in a few pages the views of all previous inquirers into the nature of the psychoneuroses the author of the above proceeds:—

“ It seems, nevertheless, entirely possible to find a con-

cept that is significantly descriptive of the psychoneurotic picture, that unerringly identifies the patient, explains the psychogenesis and idiosyncrasy of his symptoms, points the way to therapy and prophylaxis, and is yet intrinsically intelligible, is relevant to the systematic accounts of the average mind, and for which a neural counterpart or correlate is without difficulty conceivable."

He proposes that the redintegrative mechanism, "whereby a part reinstates a previous whole, is one of the most enlightening concepts ever offered to psychology," and occupies sixty odd pages in elaborating this thesis.

Whatever value there may be in the theory of redintegration (which is not so novel as the author appears to think) is not enhanced by his allusion to the salivary reflex in man. This, he says, is not easily produced unless the total situation is present, quoting Lashley's remark that the only effective stimulus to this reflex in the human being is the knowledge of a solid object held between the teeth. Surely the members of a band are not psychoneurotic when the sight of a small boy sucking a lemon elicits a reflex salivation!

Psychoanalysts will not feel their withers wrung by this effort to eliminate the censor, sublimation and symbolism, for it merely states the fact that in some persons excessive reactions follow inadequate stimuli, whereas Freud and his followers claim the discovery of the underlying cause.

Besides redintegration we are informed that motivation and environment play a part in the production of psychoneurotic symptoms. A fact readily appreciated by anyone who has had to deal with military patients, and scarcely requiring argument.

The latter part of the book is occupied chiefly by tables of experiments carried out on American soldiers, the results of which are, in nearly every case, acknowledged to be uncertain and based on insufficient evidence.

Whatever may be the case in the American Army, grave doubts will be felt in these countries as to his conclusion that "the very factor that predisposes the private soldier towards hysteric symptoms is also the factor that originally determined his military status and his failure to receive a commission. Officers are commissioned because of just that

degree of intelligence which predisposes them toward the anxiety picture."

Many psychologists seem to believe, and certainly act on, the principle that words are given us to conceal our thoughts; the American language appears peculiarly adapted to this end, and in the present instance suspicions are aroused as to the matter concealed. Sufficient evidence has already been given of the style that pervades this production, almost every sentence in which requires to be read twice before proceeding to the next.

ABSTRACTS OF CURRENT LITERATURE.

GYNÆCOLOGY.

MORSE, A.: *The Significance of the Pelvic Outlet in Perineal Lacerations, Cystocele, and Prolapse.* "American Journal of Obstetrics and Gynæcology." August, 1921.

An investigation dealing with 100 cases of women who suffered from various degrees of perineal laceration revealed certain interesting facts.

1. Mensuration of the pelvis showed a bony outlet of normal dimensions in 79 cases, a typical funnel pelvis in 21.

2. Cystocele or prolapse was the most prominent feature in 60 of the 79 normal cases. In the other 19 a perineal laceration only was present.

3. In the 21 cases of funnel pelvis, lesions of the soft structures in the anterior half of the pelvis were present in 7 cases only.

4. In 19 women in whom the outlet was normal and in whom there was no prolapse, or cystocele, present there were four instances of forceps delivery. The other 60 cases in which lesions were present but which possessed normal bony outlet gave a history of instrumental delivery in 40 per cent.

5. Sometimes, though rarely, cystocele and prolapse follow upon one spontaneous delivery.

The author puts forward a strong plea for the measurement of the bony outlet of the pelvis before secondary repair of perineal laceration is undertaken. This procedure he considers to be essential in the case of women during the child bearing period, in order to determine with a fair degree of accuracy the degree of plastic work which will be necessary.

LOUIS CASSIDY.

OKABAYASKI, H.: *Radical Abdominal Hysterectomy for Cancer of the Cervix Uteri.* "Surgery, Gynæcology and Obstetrics, 1921."

The author claims for his method (1) that the operability of cervical cancer has been raised to 81.5 per cent.

(2) That a much wider resection of parametrium is possible than by Wertheim's method.

(3) That his technique enables the operator to deal as safely with advanced cases as with the early ones. (4) That the blood loss is comparatively slight. His technique may be shortly summarised as follows:—1. After the abdomen is opened the infundibulo-pelvic and round ligaments are dealt with in the ordinary way. The broad ligament is cut from the ligature towards internal os. Blunt dissection separates both layers of the broad ligament outwards to the pelvic wall, then the loose tissue is separated from the pelvic floor from the posterior

wall of pelvis to the antero lateral portion of bladder. Uterine arteries are ligated.

(2) The ureter is freed from the posterior layer of broad ligament.

(3) The rectum is carefully separated from vagina.

(4) The uterus is pulled forward and the rectum upwards and backwards in the middle line ; forceps are placed on cut end of the utero-sacral ligaments, thereby putting ligaments on the stretch, these structures with all the lateral parametrium are carefully cut away with scissors until the pelvic floor lies exposed.

(5) The bladder is then separated from the uterus.

(6) Ureters are isolated. The sheath of ureter is split open.

The ureteral canal is dilated, its roof incised and the ureter exposed throughout its whole length.

(7) The tissue connecting the postero lateral portion of the bladder with the side wall of vagina and cervix is now put on the stretch by pulling on the parametrium dissected out in the first stage of the operation ; this band is divided between two forceps, one placed near the uterus and the other as near as possible to the bladder.

(8) The division of the lateral paravaginal tissue is then proceeded with, by separating it from the vagina and tying it off between two or three ligatures.

(9) The vagina having been clamped with Wertheim's clamps is cut across with Paquelin's cautery. Gauze is pushed into vagina to absorb any discharge expressed from the uterus. If there is no fear of infection the vagina is at once closed.

(10) Removal of any enlarged pelvic glands is now carried out, and after the raw surfaces have been covered over by peritoneum the abdomen is closed in three layers in the ordinary way.

LOUIS CASSIDY.

THOMPSON, W. B. : *The Treatment of Placenta Prævia*. "Johns Hopkins Hospital Bulletin," XXXII., 365, 228.

In a paper on the treatment of placenta prævia the author comes to the conclusion that conservative measures give better results than radical. Placenta prævia is more common in the white than the black woman. The multipara is more subject to the complication than the primipara while as regards variety, partialis was found to be most frequent. There is an excellent table showing the different forms of treatment employed, and the "Ballon" gives the best statistics. It is a pity that while in the paper there are no deaths reported with this last treatment there is one fatality reported in the text ; the author states that the patient was so ill on admission that it did not matter what treatment was employed but certainly in our opinion it should have been included. Manual dilation of the cervix was employed fifteen times with two maternal deaths and this treatment which we believed had been given up a decade ago has now been discontinued in the Johns Hopkins Hospital. We are surprised to find

that Braxton Hicks' version was only done twice and that plugging of the vagina was never performed.

BETHEL SOLOMONS.

BOURRET (*Hydramnios*. "Gazette Des Hopitaux," No. 78. 94th Year, 1242) has a masterly monograph on the symptoms, diagnosis and treatment of *Hydramnios*. He outlines the symptoms which will necessitate active treatment and suggests that the evacuation of fluid should be done by the abdominal route by puncturing the abdomen and uterine walls with a fine trocar. There is no logical reason given for preferring this to the vaginal route.

BETHEL SOLOMONS.

BECK, A. C. : *The Two-Flap Low Incision Cæsarean Section*. "Surgery, Gynæcology, and Obstetrics," XXXIII., 3. 290.

BECK puts forward a plea for the two-flap low incision Cæsarean section. His article contains the charts of twenty-nine patients, all of whom were more or less infected, and who recovered. The technique is described in detail with figures. He concludes as follows:—

1. Admitting the possibility of error in attempting to draw conclusions from a small series of cases, we feel that this technique will eliminate the consideration of an elective Cæsarean section in border line cases of dystocia.

2. By permitting the use of an efficient test of labour, most of these patients will be delivered through the natural passages.

3. The few that fail may with some slight risk be delivered by the use of the above described technique.

4. So-called potentially infected cases frequently are not infected. Whenever our opinion in this respect is erroneous our technique does not sacrifice a non-infected uterus and thereby preserves the functions of menstruation and reproduction.

5. While our results in the infected cases are better than may be anticipated in the larger series, they indicate that the mortality will be less than 10 per cent. As this is the admitted mortality of craniotomy as well as hysterectomy following Cæsarean section in this class of cases, it would seem that the two-flap, low incision Cæsarean section should be given the preference in all cases in which the child is alive.

BETHEL SOLOMONS.

RANSOHOFF and DREYFOOS ("Surgery, Gynæcology and Obstetrics" XXXIII., 3, 296), draws attention to the danger of sudden death from rupture of varicose veins on the surface of myomata. The literature of the subject, which is meagre, is given and a case which occurred in the practice of the authors is reported in extenso.

BETHEL SOLOMONS.

HEALY, W. P. : *Postoperative Tetany Due to Sodium Bicarbonate.*
" Amer. Jour. Obstet. and Gyn." August, 1921.

SEVEN cases of tetany following gynæcological operations are recorded over a period of four months; the first four which ended fatally, showed tachycardia, profuse diaphoresis, hyperpyrexia, epigastric distress, in addition to the usual signs of muscular spasm in the upper and lower extremities. The last three cases of the series recovered promptly when treated with calcium lactate.

" The source of the trouble was apparently finally traced to the glucose and sodium bicarbonate enema administered as a routine to most of the major operation cases. This was supposed to contain 5 per cent. glucose and 5 per cent. sodium bicarbonate in eight ounces of water at a temperature of 100° to 110° F. It was given as soon as possible after the return of the patient from the operating room, and was repeated again in four hours. The first enema also contained forty grains of sodium bromide. Through an error in calculation, 1200 grains of sodium bicarbonate was given in each enema instead of 180 grains."

Münzer's experiments on rabbits are quoted; he injected 10 per cent. solutions of various sodium salts, and produced with each reflex muscular excitability, fibrillary twitching, tremor tonic-clonic convulsions with opisthotonos, and death. Healy believes that the post-operative tetanus in the 7 cases recorded was due to sodium poisoning and not to alkalosis, since the three cases treated with calcium recovered.

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THE OCCURRENCE OF UREA IN
NATURE.

THEORY OF THE MODE OF FORMATION OF UREA
IN PLANTS AND IN ANIMALS. CYANIC ACID
IN ITS RELATION TO PROTEIN BUILDING, AND
PROTEIN DEGRADATION.

BY EMIL A. WERNER

IN the case of all carnivorous and omnivorous mammals the excess nitrogen is excreted by the kidneys chiefly as urea, whilst in herbivorous mammals it is largely supplemented by hippuric acid, which is present only to a very small extent in human urine.

In birds and reptiles, nitrogen leaves the system almost entirely in the form of uric acid.

Whilst there is, apparently, so far no chemico-physiological explanation for this difference in nitrogen metabolism between birds and mammals, it must be remembered that urea, and uric acid, are both immediate derivatives of cyanic acid in the keto-form ($\text{o}:\text{c}:\text{NH}$).

Whilst Prévost and Dumas (1823) showed that urea is present in the blood, modern research has proved its presence in practically all the fluids and organs of the body.

Since all animals obtain their nitrogen primarily from a vegetable source, the question of nitrogen metabolism in the vegetable kingdom requires first consideration.

Urea in its relation to Nitrogen Metabolism in Plants.

Up to comparatively recent years urea was considered to be a product peculiar to animal metabolism.

Bamberger and Landsiedl (1903) appear to have made the first observations on the occurrence of urea in fungi, and their results were soon confirmed and extended by other observers, Gaze (1905), Goris and Mascré (1908), so far as the lower plants are concerned.

It was not until 1912 that Fosse showed that a considerable number of the higher plants produce urea when germinated under such conditions, that urea is excluded from the system.

In the leaves of spinach, endive, potatoes, carrot, turnip, gourd, melon, and in the leaves and young plants of barley, maize, wheat, clover, beans, and peas urea was readily detected, and in several cases estimated, by aid of the delicate xanthhydrol reaction.

In pea plants, one month old, 0.064 per cent. of urea, calculated on the dry material, was found.

Urea was also isolated by Fosse (1913) from cultivations of *Aspergillus Niger*, and *Penicillium glaucum*, grown on a solution in which nitrogen was supplied in the form of ammonium nitrate.

Whilst urea was found in several other higher plants besides those mentioned, Fosse (1913) has considerably extended our knowledge as regards the production of urea in low forms of animal life. Its presence was proved in different types of the following invertebrates, and in their excretion products: coelenterata, echinoderms (starfish), worms, crustaceans (crayfish, lobster, and shrimp), insects (silkworm), molluscs (snail, oyster, mussel).

In the case of silkworms, the absence of urea in the mulberry leaves, with which they were fed, was proved. Whether this is an indication that urea is not formed in perennial plants, is a subject for future investigation.

Of particular interest is the simultaneous presence of urea and urease in the same plant, shown by Fosse (1914-'16). Urea was found in green pea plants, 14 days old; the expressed juice (5 c.c.'s) of plants from the same lot was mixed with 5 c.c.'s of a 1 per cent. solution of urea in the

presence of chloroform. After fifteen and a half hours at 44 degrees, 30 per cent. of the added urea was destroyed, and 78 per cent. was destroyed after thirty-nine and a half hours. No urea was destroyed by juice which had been previously boiled.

Similar experiments were made with soja plants 35 days old. Urea was found in the cold juice expressed from 150 grams of the fresh plants; four grams of the crushed plants added to 10 c.c.'s of 0.5 per cent. solution of urea in the presence of chloroform, destroyed all the urea after five hours at 44°C. A control experiment proved that plants which had been previously heated in an autoclave at 100° had no action on a solution of urea.

Reference was made in a previous paper to the presence of urease in seeds other than those derived from leguminous plants.

Fosse (1916) found that the following crushed seeds were capable of 'hydrolysing' urea in solution in the presence of chloroform: ergot of rye, French grass, carrot, hemp, orange, mandarin, apple, pear, plum, almond and marrow. An extract of the *young* leaves of chestnut, lime and nettle was also active in this respect.

On considering the results of all this interesting work, one ventures to make the sweeping assertion that urea is a constant product of the breaking down of vegetable protein during the germination of all seeds.

As Fosse has pointed out, "the plant can be the seat of the two inverse phenomena of formation and destruction of urea." This condition, in all probability, can only obtain in young plants, since the function of urease is to destroy urea produced from proteins as the result of hydrolysis and oxidation.

We can understand why certain leguminous seeds so rich in protein should also be rich in urease. Those seeds which, in the dormant state, do not happen to contain the enzyme ready formed, produce it no doubt in quantity during the process of germination.

Urease, in its relation to vegetable protein, is therefore comparable to zymase in its relation to starch. Whilst the latter enzyme is the active agent in the final breaking down

of starch into the simple products, alcohol and carbon dioxide, urease is the active agent in the corresponding resolution of protein into the simple products, cyanic acid and carbon dioxide. The ultimate oxidation of alcohol to carbonic acid and water, from which the plant originally prepared the starch, and the hydrolysis of cyanic acid to carbonic acid and ammonia, from which the protein was originally prepared, these are changes with which the respective enzymes are not directly concerned.

Theory of Protein Formation in Plants.

When the plantule has derived all the energy it can from the breaking down of the reserve protein in the seed, one of the chief functions of the developed plant is to build up protein by the assimilation of nitrogen and carbonic acid. It seems very probable that the first step in this mysterious process is brought about either by the change: $\text{CO}_2 + \text{NH}_3 = \text{HN}:\text{CO} + \text{H}_2\text{O}$, or $\text{CO} + \text{NH}_3 + \text{H}_2\text{O}_2 = \text{HN}:\text{CO} + 2\text{H}_2\text{O}$, a condensation of cyanic acid with 'nascent' carbohydrates giving rise to proteins. just as condensation of $\text{H}_2:\text{CO}$ alone can give rise to the complex carbohydrates.

Fosse (1916) has proved the formation of urea by the oxidation of a solution containing 1.5 gram of glucose and 0.01 gram of ammonia per liter. That is a solution containing about the same proportion of glucose as is normally present in blood, and even less ammonia than would be contained in the fluid of a living cell.

Now in all cases where the formation of urea has been shown by the oxidation of protein matter, of an amino-acid, or of a carbohydrate in the presence of ammonia, Fosse (1919-'21) has clearly demonstrated that cyanic acid is the precursor of the urea.

Whilst the writer is not prepared to accept the theory of the formation of cyanic acid which has been put forward by Fosse (1919), which involves the intermediate production of hydrocyanic acid, the main point is the recognition of cyanic acid in all these oxidation changes.

It is obvious, as Fosse has pointed out, that the urea molecule cannot participate in nitrogenous nutrition without suffering a preliminary decomposition, which is assumed

to be the production of ammonia and carbonic acid by the action of urease. We know now from Fearon's work (1921) that the action of the enzyme is limited to the production of ammonia and cyanic acid. If the latter, as suggested by the writer, is directly concerned in the building up of proteins, then its hydrolysis in the plant cells is a superfluous change. Now, we have interesting evidence in support of this view in the experiments carried out many years ago by Ville (1862). This investigator showed that urea acted as a powerful stimulant to vegetation on plants grown in an artificial soil of sand. Urea was more efficacious than carbonate of ammonia, and its favourable results were manifested with greater rapidity.

With ethylurea, the results were very different, the growth was checked, the plants drooped and were stunted, the effect being the same as if the sand had not received the addition of any nitrogenous material.

The experiments were repeated a great number of times over a period of two years. The results did not vary.

Seeds were found to germinate in the ordinary manner in the presence of ethylurea, but as soon as the young plants put forth their first leaves, the extremities of these became white and shrivelled, and the effect gradually spread over the rest of the leaf.

The changes during germination being independent of the presence of an outside source of nitrogen, growth proceeded for a short time on normal lines.

Lutz (1898, 1901) has shown that many flowering plants—algæ and fungi—can assimilate nitrogen supplied in the form of methylamine or ethylamine. This goes to show that in Ville's experiments the results were due to nitrogen starvation, and not to any poisonous effect of ethylurea or of ethylamine possibly generated from it.

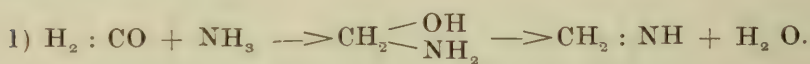
The absence of an enzyme capable of decomposing ethylurea *at the ordinary temperature* into ethylamine and cyanic acid explains Ville's results in the light of modern investigations.

Whilst the superior effect of urea, as compared with a simple salt of ammonia, in promoting vegetation is to be ascribed to its power of immediately supplying cyanic acid,

the subsequent production of the latter from the ammonia generated at the same time requires consideration.

The formation of cyanic acid by the oxidation of ammonia in the presence of carbohydrates is probably a slower reaction, at the ordinary temperature, than the decomposition of urea by urease.

Formaldehyde being the first product of carbon assimilation, the above change may be assumed to proceed on the following lines:—



It is probable that reaction (2) is brought about by the 'catalytic' effect of one or other of the different types of enzymes collectively classed as 'oxidases,' which are so widely distributed in plant cells.

According to the theory presented here, it follows that so far as assimilation of nitrogen from ammonia is concerned, the phenomenon is inseparably connected with carbon assimilation.

Takabayashi (1897) found that 0.05 per cent. solutions of carbonate of ammonia had an injurious effect on certain plants, such as barley, wheat and onions, but this was counteracted by supplying the plants with cane-sugar or with glycerol. Experiments with other ammonium salts confirmed their injurious effect in the absence of sufficient sugar in the plant.

Since the function of the plant is to build up protein from urea, or from any other source of nitrogen available, it seems highly probable that the 'formation' of urea in developed¹ plants is accidental rather than intentional. Its occurrence is, in the writer's opinion, strong evidence of the production of cyanic acid as the first step in protein building

In the germination stage, plant metabolism is very similar to animal metabolism, since the young embryonic plant is at first wholly, and later partly, dependent on the complex reserve food material of the seed. Whilst energy is derived from the breaking down of the protein, and urea finally formed this is not rejected, as in the case of the animal, but with the aid of energy from the sun is used to build up protein again

The Formation of Urea in Animal Metabolism.

Dumas and Cahours (1842) were the first to suggest that urea is a product of the combustion of nitrogenous matter in the body. It is now a recognised fact that the complex proteins are broken down in the tissues into simpler compounds which are ultimately converted into urea. In this way nearly all the nitrogen of the food which is in excess of the requirements of the tissues is passed out of the body. Where is urea formed in the body, and what is the mode of its formation? These are two questions which have been the subject of numerous investigations by physiologists and chemists since the middle of the last century.

The first question is mainly of physiological interest. Considered from a purely chemical point of view, it matters little where urea is formed. Though the intermediate stages in the breaking down of protein may vary in different parts of the body, the mechanism of the final generation of urea must be the same, wherever be the seat of its formation.

Hence only the mode of formation of urea is considered here, since its constitution and the mechanism of its synthesis are subjects of paramount importance in supplying an answer to the second question.

Whilst a good deal of advance has been made in recent years towards elucidating the constitution of the complex protein molecules, our knowledge is still far from sufficient to enable us to follow the separate stages in the cleavage of the protein molecule up to the ultimate formation of urea. For this reason only views regarding the nature of the immediate precursors of urea have been put forward from time to time in keeping with the advancement of our knowledge.

These views may be briefly summarised as follows:—formation of urea from:—

(1) Ammonium carbonate, by dehydration (Schmiedeberg, 1879).

(2) Ammonium cyanate, by isomeric transformation (Sal-kowski, 1877; Hoppé-Seyler, 1881).

(3) Ammonium carbamate, by dehydration (Drechsel, 1881).

(4) Monoamino-acids, by oxidation in presence of ammonia (Hofmeister, 1896).

(5) Arginine, by hydrolysis (Kossel and Dakin, 1904).

Whilst the chief difficulty in explaining urea formation in the body is attributed by physiologists to our ignorance of the constitution of the proteins, the constitution of urea itself has, as a matter of course, been considered to be beyond dispute, and hence the 'carbamide' formula has been the basis for all argument.

This has really been the chief cause of the difficulty in understanding the mechanism of the final stages in the excretion of excess nitrogen from the body.

The light which recent researches have thrown on the structure of the urea molecule, and on the mode of its formation in plants must obviously help greatly to illuminate our views on the vexed question of urea formation in animals.

It has been abundantly proved by the writer (1912-'20) that in all syntheses of *free* urea, the final change is direct union of ammonia and cyanic acid in the keto-form, $O:C:NH$. Is there any reason to suppose that *free* urea is produced otherwise in the living cell?

The oxidation of a great variety of nitrogenous and non-nitrogenous carbon compounds in the presence of ammonia has been shown by Fosse to give rise to cyanic acid, whereby formation of urea.

As regards the different precursors of urea which have been suggested, it is perhaps remarkable that ammonium cyanate is the only one which has been almost unanimously turned down by modern physiologists as the least acceptable of the lot.

On the ground that cyanates do not occur, or, to be precise, have not been detected, in the body, this source is believed to lack the necessary physiological evidence to allow of its being seriously considered.

Now, in what form might one expect to find cyanic acid in the body? say in the liver, the chief seat of urea formation in the animal system. As sodium, potassium, or calcium salts perhaps, but certainly not as ammonium cyanate. Yet

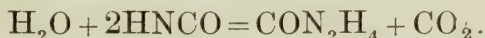
since salts of ammonia are present in the liver the tendency would be to form the cyanate.

As a matter of fact, cyanic acid must be formed in the liver, *otherwise urea would not be found there*.

The presence of urea is, in the writer's opinion, the most convincing evidence that cyanic acid was its precursor. The formation of cyanic acid by oxidation of carbon compounds in the presence of ammonia has been already referred to in connection with urea formation in plants, but it is well to point out here that cyanates and cyanic acid are very resistant to further oxidation.

In view of all the facts it seems reasonable to conclude that cyanic acid is the final product of the oxidation of the cleavage products of the proteins in the body.

In the various amino-acids derived from the proteins, we have the groups— $\text{H}_2\text{C}-\text{NH}_2$, $=\text{HC}-\text{NH}_2$, $=\text{HC}-\text{NH}$ —which could readily yield $\text{O}:\text{C}:\text{NH}$ as the final stage of their oxidation. This is all that is necessary in order to attain the object required—namely, the elimination of excess nitrogen from the body in a practically neutral form. For it must not be forgotten that cyanic acid is quantitatively hydrolysed to urea by water alone, thus:—



Why, therefore, should Nature proceed to the formation of such end products as carbon dioxide and ammonia, with subsequent production of either ammonium carbonate or carbamate, to be followed by a process of dehydration before urea is ultimately formed?

Since we know now that the formation of urea from ammonium carbamate—Basarov's synthesis—is dependent on the production of cyanic acid, it is useless to discuss any further the idea that carbon dioxide and ammonia are precursors of the formation of urea in the body.

Hofmeister's suggestion, that the oxidation of amino-acids in the presence of ammonia is responsible for the formation of urea, was deprived of its value as an essential advance in our knowledge of the subject by the fact that the production of cyanic acid as the immediate precursor of urea was not contemplated.

Assuming—and the evidence in its favour is overwhelm-

ing—that cyanic acid is the final product in the ‘ biotic oxidation of protein, we will now pass on to a consideration of this theory in its relation to the results which have been obtained in investigations to solve the ‘ urea-formation ’ problem.

Cyanic Acid as the Immediate Precursor of Urea in the Animal Organism.

It is a well-established fact that the administration of ammonium salts to animals is followed by an increase in the output of urea.

The following extract from a standard work on physiological chemistry² will enable the reader, who is not familiar with the results which have been obtained on this matter, to appreciate the views which are entertained regarding it:—

“ Ammonium carbonate, and all other ammonium salts which are capable of being converted into it in the tissues, are changed into urea by the animal organism. This applies to the carnivora as well as to the herbivora. After the administration of sal-ammoniac, NH_4Cl , to rabbits the increased elimination of urea corresponded exactly with the amount of nitrogen added in the form of sal-ammoniac. The results were not so definite with human beings and dogs. A part of the ammonia appeared in the urine, and, from the uncertain increase of urea, it remained undecided whether this was due to the ammonia diet or an increased disintegration of albumin. The cause of the difference between the carnivora and the herbivora was soon discovered. It depends on the following:—The food of the herbivora yields an alkaline ash, and during its combustion in the organism it forms potassium carbonate, which can react with ammonium chloride. Ammonia is liberated, and can be utilised for the production of urea. The food of the carnivora furnishes an acid ash. The hydrochloric acid is not separated from the ammonia in the tissues, and consequently the latter is not available for the production of urea. If, on the other hand, we feed some ammonium carbonate to a dog, we like-

²Text-book on Physiological Chemistry. E. Abderhalden (1908).

wise observe an increase of urea. These experiments, therefore, indicate that the organism of mammals is capable of utilising ammonia for the production of urea. Observations have indicated the probability that ammonia normally—*i.e.*, without being artificially administered—participates in the formation of urea. If the utilisation of ammonia in the formation of urea has been established, we must determine whether it is to be assumed that all, or at least the greater part, of the amino groups present in the tissues are split off as ammonia, and thus take part in the production of urea.”

It will be seen from the foregoing observations that the formation of free ammonia is assumed to be an essential condition in order that urea may be produced from the oxidation of protein in the body.

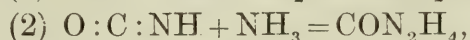
Modern investigations appear to favour the view that ammonia is generated by hydrolytic ‘de-amination’ of the cleavage products of the proteins—*i.e.*, the amino-acids.

Now, according to the writer’s theory of cyanic acid as the immediate precursor of urea in the body, the production of ammonia, *in addition to and independently of*, cyanic acid is not necessary.

Why, therefore, should Nature produce it?

On the other hand, it is obvious that the artificial administration of ammonia must lead to a considerable increase in the amount of urea *excreted*, without any increase in the amount of urea *formed* by the breaking down of protein.

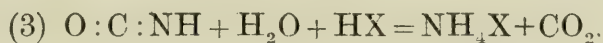
A comparison of the two equations:—



shows that theoretically twice as much urea can be formed from the same amount of cyanic acid if ammonia is present, so that equation (2) may be realised in the body in preference to equation (1).

It is a well-known fact that the administration of an excess of acid in the diet to animals tends to lower the amount of urea excreted, with a corresponding increase in the elimination of nitrogen as ammonia.

In this case the result is readily explained by the equation:—



Thus, it will be seen that by the production of cyanic acid, as the end product of protein disintegration, Nature supplies the body with the means, metaphorically speaking, of actually 'killing three birds with the one stone.'

Normal excretion of nitrogen as urea is represented by equation (1), excess of alkalinity (as ammonia) is disposed of by equation (2), whilst excess of acidity is dealt with according to equation (3).

In the healthy animal organism, therefore, the extent of protein oxidation—cyanic acid formation³—is the same whether the amount of urea excreted is increased or diminished by the administration of ammonia or acids respectively. This distinction between the amount of urea *formed* and the amount *excreted* under abnormal conditions is not clearly indicated by any of the previous theories of the immediate precursors of urea.

The observation of Schmiedeberg (1877), that after the administration of ethylamine carbonate to animals, ethylurea is found in the urine, is interesting confirmation of the 'cyanic acid precursor' theory. Any animo-compound not easily broken down by oxidation or hydrolysis should appear in the urine in the form of the corresponding urea derivative.

There is plenty of evidence on record that such is the case.

Are Carbamates Excreted in the Urine?

A few observers claim to have recognised the presence of carbamates in urine. Abel (1891) presumingly obtained evidence of carbamates in considerable amounts in the urine of human beings and dogs after the administration of milk of lime. Calcium carbamate apparently would be the salt present, but it is more than likely that this has been mistaken for calcium cyanate, the possible presence of which was not contemplated. Drechsel (1878) showed that calcium carbamate— $\text{Ca}(\text{O}.\text{CO}.\text{NH}_2)_2.\text{H}_2\text{O}$ —was extremely unstable in aqueous solution, whilst the solid at the ordinary tem-

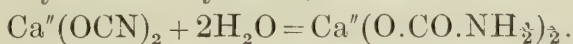
³ This really corresponds to what is generally termed urea formation in physiology on the basis of the theories which have been hitherto considered.

perature soon developed an ammoniacal odour, being decomposed (hydrolysed) by its own water of crystallisation.

The chances of calcium carbamate remaining unchanged in solution in a large volume of water at the temperature of the body are extremely remote.

Calcium cyanate, on the other hand, is much more resistant to hydrolysis, and the writer has not been able to find any tests used to recognise the carbamate which would distinguish it from the cyanate.

Whilst there can be no hesitation in turning down the theory of the formation of urea by the dehydration of ammonium carbamate, it is no harm to point out that a carbamate may be formed in urine as an intermediate product of the hydrolysis of a cyanate; thus:—



Admitting it did occur, it would no doubt be confined to voided urine after it had been kept for some time. Whilst it is difficult to see how either the presence or absence of carbamic acid in normal urine could be proved once the presence of a cyanate is admitted, it follows that the evidence on this point must be accepted with full reserve.

The Relation of Cyanic Acid to other Nitrogenous Compounds in Urine.

In round numbers ninety per cent. of the total nitrogen normally excreted by the kidneys is found in the urine as urea, together with a small proportion of combined ammonia.⁴

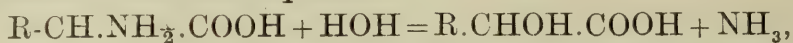
The remaining ten per cent. is distributed amongst several substances, the chief of which are uric acid, creatinine, hippuric acid, xanthine, and hypoxanthine.

Uric acid is commonly considered as a diuréide, and to be built up of two urea residues—HN-CO-NH—presumably derived from the ‘carbamide’ formula—united by the tri-carbon nucleus— $\overset{|}{\text{C}}=\overset{|}{\text{C}}-\text{CO}-$, the molecular constitution being represented thus:—

⁴ Since urine is normally acid in its re-action, it is not surprising that a certain proportion of nitrogen should be present as “saline” ammonia. This would result from cyanic acid in accordance with the normal realisation, to a small extent, of equation (3).

intestine, and were transported unchanged to all the different tissues of the body.

The resistance of amino-acids to hydrolysis *in vitro* in accordance with the equation:—



is well known. In fact such a change is only brought about under exceptionally severe conditions, as, for example, in the well-known Kjeldahl process⁶—*i.e.*, so far as obtaining ammonia is concerned.

If amino-acids showed a tendency to be hydrolytically deaminated they could not be obtained in quantity as the result of the hydrolysis of proteins by strong hydrochloric acid. It may be argued that changes are effected in the animal organism under conditions which are not capable of being imitated *in vitro*.

Such an argument is based on our ignorance of the *mechanism* of the vast majority of the chemical changes which take place *in viva*, and not on our knowledge of the mechanism of any one.

The formation of urea in the body is an interesting case in point. The dehydration of ammonium carbonate or carbamate, it does not matter which, has been the favourite theory of the origin of urea. Since ammonium carbonate is not normally present in urine, urea must be quantitatively formed from it *by dehydration* at the low temperature of 36-37° C. Now, in order to imitate this seemingly simple change *in vitro*, a high temperature, and a high pressure are necessary, and even then the yield of urea is small. If the *mechanism* of the change is the same *in viva*, and *in vitro*, we have no explanation for this difference.

When the true origin of the formation of urea *in viva* is brought to light, we find no difference in the conditions under which the change can be effected outside the body, for the simple reason that the formation of natural and of artificial urea in the free state is similar in mechanism.

Most of the chemical changes taking place in plants, and in animals, are effected through the agency of enzymes. It is interesting to note that in every case where an enzyme, or

⁶Or by treating to a high temperature with fuming hydriodic acid.

the preparation, containing the active elements, which we call the enzyme, responsible for any definite chemical change has been isolated from its natural source, it is found to reproduce the particular change *in vitro* under conditions no different as regards temperature, pressure, and nature of solvent, and on the same lines as when in the living organism.

Fosse and Rouchelman (1921) found that during the aseptic autolysis of fresh liver there was marked formation of urea, but no urea was formed after the liver had been previously immersed for some time in boiling water.

Whilst the formation of cyanic acid as the end product of protein oxidation in the body is no doubt the result of an enzyme action, hydrolysis of the acid with production of urea is quite independent of such an agent.

Now certain enzyme actions can be imitated by artificial means, and the production of cyanic acid by the oxidation of proteins is one. By the oxidation of blood to which dextrose had been added, Fosse (1919) obtained a considerable yield of urea; thus under the most favourable conditions the amount of urea formed was equal to 40 grams per litre of blood.

Is it not likely that every one of the chemical changes in the body could be imitated *in vitro* if the full mechanism of each was known?

In conclusion, it may be of interest to point out the following analogy:—

The reciprocal action of animal and plant life in relation to carbonic acid and carbon assimilation is well recognised. From carbon dioxide and water plants build up complex carbohydrates from which animals derive energy in oxidising them to the two simple substances from which they were formed. Similarly plants absorb ammonia which is oxidised in the presence of carbohydrates to cyanic acid, which is used in the building up of protein matter. Animals, by hydrolytic and oxidation changes, break down proteins to cyanic acid and ammonia, which are excreted as urea, from which plants again derive the necessary material to continue the cycle of changes.

The chemical analogy between the simple compounds concerned in the two changes is also of much interest, thus:—

$O:C:O$ and $H.O.H.$ (in carbohydrate formation).

$HN:C:O$ and $H.(NH).H.$ (in protein formation).

The similarity between the oxygen atom and the imino-group (NH) being recognised in many cases amongst carbon compounds.

AN UNUSUAL CASE OF MIKULICZ DISEASE.*

BY T. GILLMAN MOORHEAD.

IN the year 1888, and again in the year 1892, Mikulicz described the syndrome, which has since that date borne his name. The condition which he described was one of symmetrical enlargement of the lachrymal glands, followed later by a similar enlargement of the salivary glands. His paper called general attention to the condition, and soon many other writers put on record cases of a similar nature. Before long, it was recognised that the cases could be grouped under different headings, and in the year 1909, Howard, in an important paper, published in "International Clinics," gave a summary of all hitherto recorded cases, and grouped them into three heads:—(1) Mikulicz's disease proper. (2) Pseudoleukæmia. (3) Leukæmia. The first group comprised fifty-five cases, for the most part in adults, and characterised merely by symmetrical enlargement of the lachrymal glands, and later, of the salivary glands, without blood changes, and without any general symptoms. The enlargement of the glands was found to be due in most cases to an overgrowth of connective tissue, with an infiltration of small round cells. The disease, though often of long duration, showed little tendency to shorten life.

Group two consisted of twenty cases, in which the clinical picture was similar to the pure Mikulicz's disease, except that there was in addition enlargement of the lymphatic glands, and sometimes of the spleen. The glands when microscopically examined, showed the typical condition characteristic of Hodgkin's disease.

Under group three only six cases are reported, but, as Howard points out, enlargement of the lachrymal and salivary glands had been recognised in the course of leukæmia long before Mikulicz first called attention to his syndrome. These cases present the usual clinical and pathological picture of lymphatic leukæmia. The case I am

*Read before the Section of Medicine, Royal Academy of Medicine, in Ireland, November 11, 1921.

about to report belongs to this group, and is only put on record on account of the unusual early history.

The patient, a man aged 48, a farmer by occupation, was sent to me owing to increasing weakness, and the development of lumps in different parts of his body. He said that about nine years ago he was troubled with a persistent sore throat, and, in consequence, came up to Dublin to consult a throat specialist. Nothing wrong was detected at the time, and the patient returned to the country, but continued to suffer from throat pains. In 1919 the pains became worse, and he then began to suffer from difficulty in swallowing, so in June of that year, he came up to see Sir Robert Woods, who found the tonsils enormously enlarged. The tonsils were removed, and sent for pathological examination, the following report being received from Professor O'Sullivan:—Tumours consist entirely of small round cells, with thin walled vessels. The structure of the tonsil (follicular structure) has entirely disappeared. It is a lymphoma. These growths in the tonsil are often malignant. There is some infiltration of the capsule, with tumour cells, and I therefore think that these growths are probably malignant.

After the operation the patient was treated by X-rays, receiving one exposure to the throat, at intervals of a month, but, in June, 1920, a further operation was necessary, to remove some masses at the back of his throat. Again in October, 1920, he consulted Sir Robert Woods, owing to deafness, and obstruction in the nose. A further operation was performed, and radium treatment was employed. The patient again returned to the country, but, towards the end of November, 1920, he began to observe the development of lumps all over his body, which resulted in his coming up to consult me.

On examination when he first presented himself, he showed a very anæmic appearance. There was bilateral enlargement of the lachrymal glands, both parotids and both submaxillary glands were also enlarged, while the sublingual glands formed a raised and very obvious ridge in the floor of the mouth. The lymph glands throughout the body, including those in the chest (as observed by X-rays) were all enlarged, and the spleen showed a moderate degree of

enlargement. A blood examination made at the time of admission gave a total white cell count of thirty-five thousand, the percentage of lymphocytes being eighty-two. The red cells numbered two million five hundred thousand, and the Hb sixty per cent. The case thus proved to be obviously one of lymphatic leukæmia. A Wassermann test, and a tuberculin test were carried out shortly afterwards and both proved negative.

The patient is at present under treatment by X-rays, applied systematically to the spleen, and to the various groups of glands; and also by arsenical injections, and benzol capsules. Under this treatment he is showing improvement. The white cells have come down to twenty thousand, and the red cell count has increased to three million three hundred thousand, while many of the glands, including the parotids, have greatly diminished in size.

As previously stated, this case is put thus briefly on record merely on account of the unusual early history. There are few cases of leukæmia in which the initial masses develop in the throat, and still fewer, if any, in which years before any detectable lesion was present, symptoms of soreness of throat, and general discomfort were complained of.

A CASE OF SPINAL CARIES AND COMPRESSION MYELITIS : LATERAL SCLEROSIS.*

BY SIR JOHN MOORE, M.D., D.P.H.DUBL., F.R.C.P.I.,
PHYSICIAN TO THE MEATH HOSPITAL AND
COUNTY DUBLIN INFIRMARY.

ON January 22nd, 1921, Joseph D., aged 41 years, unmarried, a labourer residing at Rathfarnham, Co. Dublin, was admitted to Ward 12 of the Meath Hospital, suffering from spastic spinal paralysis, of a progressive nature and which had begun six months before admission. He stated to me that in July, 1920, in running for a tram-car, he suddenly and for the first time noticed a weakness in his back and "an inclination to sink." From that date the loss of power came on by slow degrees.

At the time of admission the patient was extremely helpless, and quite unable to walk or even to stand. He complained of weakness, stiffness, and loss of power in both lower limbs, as well as of a dull pain in the back between the blade bones. He stated that his appetite was good, although he suffered from costive bowels. For six weeks before admission he had been very sleepless and restless at night. As regards alcohol he was temperate, but he was a very heavy smoker—up to 4 ounces of tobacco a week. The family history presented no features of special interest. His father died of "valvular disease of the heart," his mother is alive and healthy.

His personal history is eventful and interesting. About 20 years ago he fell off a cart, escaping with a scalp wound of the forehead and injuries to both his thumbs. Whilst recovering from the accident, he was attacked by "scarlet fever." This was followed later on by an attack of pleurisy, which in turn was succeeded by four attacks of spitting of blood. These early manifestations of a pretubercular stage and an early tubercular infection in the case were not lost upon my clinical clerk, Mr. Victor Robinson, of Trinity

*Read before the Medical Section of the Royal Academy of Medicine, on Friday, November 11, 1921.

College, who in the course of physical examination discovered a scar in the dorsal line at the level of the right 10th rib, at which point it was evident that a pleural effusion or an empyema had been evacuated.

Thirteen years after the events just narrated, that is, seven years ago, the man met with another accident, which started tubercular disease of the right testicle, necessitating its removal by Mr. (now Sir William) Taylor.

The interscapular area was carefully examined because of the dull pain of which the patient complained. In this situation a well-marked prominence of the vertebral column was detected in the upper dorsal region.

The following notes were made by Mr. Robinson:—

Cutaneous System.—The skin feels cold in both legs. There is a well-marked malar flush. Scars are seen on both thumbs, on the scalp, and in the right axillary region—this last the result of thoracentesis. At this time, and ever afterwards, the axillary temperature was subnormal, showing a slight diurnal range which seldom exceeded one degree Fahrenheit.

Circulatory System.—The heart's sounds were pure, but not strong, and at times the heart's action was fast. The pulse varied a good deal from day to day both in volume and rhythm.

Respiratory System.—No abnormal breath sounds. Respirations 20 per minute. Probably some local pleural thickening on right side of chest interfered with vocal fremitus and the percussion note.

Digestive System.—Appetite good. Bowels confined. Motions costive. Teeth bad, but tongue clean.

Genito-urinary System.—No incontinence of urine, which was of normal colour, nearly clear, spec. grav. 1015, acid in reaction. It contained albumen, but was free from sugar. At a subsequent stage in the illness the condition of the bladder became unsatisfactory at times and gave some trouble.

Nervous System.—The patient was inclined to be extremely nervous at first. He complained of sleeplessness, but this passed off by degrees.

The lower limbs were extraordinarily spastic, becoming

rigid on the least attempt to move them when made either by the patient himself or by others. The spasticity was greater in the left than in the right leg. The patient complained of a sensation of numbness and tingling in both limbs, more especially in the left. But there was no absence of deep, epicritic, or protopathic sensibility.

In his note on the condition of the reflexes, Mr. Robinson states that, in January, 1920, the superficial reflexes—abdominal, cremasteric, and epigastric—were exaggerated. This observation I confirmed. That is not so at present (November, 1921)—on the contrary, they are practically absent.

The deep reflexes of the lower limbs were much in evidence. So violent was the knee-jerk reaction, that it started an ankle-clonus. Babinski's sign was present in both feet. But it and the other reflexes were more marked in the left than in the right limb. There was no wasting of the muscles, except such as might be caused by disuse. This was successfully controlled by massage.

Diagnosis.—Taking the personal history and the signs and symptoms into consideration, the diagnosis of a compression myelitis was arrived at, mischief having obviously spread to and involved the lateral columns, especially that on the left side, at and below the level of the spinal caries of tubercular origin which was doubtless the cause of all the trouble—paralytic and spastic.

The treatment adopted was on the following lines:—

- (1) Rest in bed, and nourishing diet.
- (2) Bowels regulated by occasional morning doses of sulphate of sodium in warm water.
- (3) Iodide (5 grains) and bromide (10 grains) of potassium, with tincture of cinchona, twice daily.
- (4) Inunction of liniment of potassium iodide and soap.
- (5) Massage of the lower limbs.

The bladder began to give trouble after some weeks, and to combat this, a mixture containing in each dose 5 grains of hexamine, 30 grains of acid phosphate of sodium, and 10 minims of tincture of henbane, was prescribed, and persevered in for some considerable time.

On March 8th, 1921, the operation of bone-grafting

(Albee) was performed by Sir William Taylor, K.B.E., who had seen the patient in consultation with me on several occasions, and to whose opinion and advice I have been much indebted. He was assisted by our colleague, Mr Henry Stokes. The object of the operation was to fix the vertebræ adjoining the seat of spinal compression so as to secure absolute rest of the spinal cord in the diseased area. The graft was taken from the front of the left tibia and fixed to the laminæ of the vertebræ involved. Both the tibial and the dorsal wounds healed without a hitch. There was slight albuminuria at the time, the specific gravity of the urine being 1015, and its reaction acid. The temperature, which all along had been subnormal, was only slightly disturbed by the operation. It rose to 99.4° forty-eight hours afterwards, but this thermal disturbance was quite transitory.

On April 21st the urine, which continued to be acid in reaction, was found to contain some blood cells and pus cells. Its spec. grav. was 1015.

On May 9th, and again on June 10th, a 5,000,000 dose of an autogenous vaccine, prepared by Dr. T. J. Lane, was injected by him without, however, any very definite result. All the time, notwithstanding, the patient seemed to be making satisfactory although very slow progress. The reflexes have gradually become less active, there is much less spasticity, and a marked improvement in general health has taken place.

A porous plastic jacket was made for him by Messrs. Smith & Sheppard, of 124 St. Stephen's Green. With its aid the patient is now able to sit up, and even to walk about the Hospital ward with a little occasional help.

My colleague, Dr. Thomas J. Lane, Assistant Physician to the Meath Hospital, has been good enough to favour me with the following report on the electrical reactions of the muscles and nerves of the patient's lower limbs at the present time:—

“ The muscles and nerves of both lower limbs react
“ normally to the faradic current, except the intrinsic
“ muscles of the left foot—especially the interossei. The

“ response of these muscles is somewhat feebler than
“ normal.

“ *Galvanic Current.*—Both limbs normal.”

Reviewing the medical history of this patient, one can hardly doubt that a widespread tubercular infection played the chief part in the production of a nervous system symptom-complex or syndrome

NOTE.—December 29, 1921. The patient, happily, continues to make excellent progress, and will probably leave hospital soon, practically restored to health..

GUMMA OF THE LIVER.

By V. M. SYNGE.

A MAN aged 49 years was admitted to the Royal City of Dublin Hospital on September 27th, 1921, suffering from ascites. He was a married man with two healthy children. He had never been sick until seven years previously, when he had undergone an abdominal operation, and had been told that he had an enlarged spleen. The operation scar was slightly above the umbilicus and to the left of the middle line. It was barely two inches in length. About the same time his left testis was removed. In 1917 he had a severe attack of hæmatemesis, which left him in a weak state for some months afterwards. Since then the hæmatemesis had recurred about every twelve months. The last attack occurred in August, 1921, when he brought up about a pint of blood. Five days later he had a further hæmatemesis, and brought up about the same quantity of blood. At this time he first noticed swelling of his abdomen, which had gradually become more distended since then. There was no history of syphilis. On admission to hospital the man was very anæmic in appearance, with a slight yellow tinge about the face. His pulse was 92, respirations 24, temperature 98. He did not appear wasted. His weight was 10st. 1lb. The abdomen showed a considerable but not extreme ascites. Owing to the amount of fluid in the abdomen there was some doubt as to the size of the spleen and liver; the former could not be palpated with certainty. There were no distended veins on the surface of the abdomen. There was œdema of the legs and eyes, and slight œdema of the hands. The heart-sounds were weak, the apex beat was in the nipple line, and there was a well-marked mitral systolic murmur which was transmitted to the axilla. The pulse was weak, but regular. The lungs were normal, except that the breath-sounds at the bases were weak. The urine was alkaline sp. gr. 1.016, contained a little albumen, but no casts, blood, bile or other abnormality. The examination of the blood gave:—Hb. 20 per

cent., r.b.c. 1,700,000, colour index=0.6, w.b.c. 7,500, marked poikilocytosis and anisocytosis, slight basophilia, no normoblasts, w.b.c. appeared normal.

The patient's condition gradually became worse, the œdema became generalised and extreme. The temperature gradually rose to near 100°, the pulse became more rapid, incontinence of urine occurred, and the patient became semi-conscious with frequent attacks of dyspnœa, and died on October 2nd.

The post-mortem showed a considerable quantity of fluid in the abdominal cavity. The fluid was opalescent, and contained a large number of desquamated cells and débris. The liver was distorted, the entire left lobe being replaced by a small, hard, nodular mass. On section this mass was seen to consist mainly of fibrous tissue with small areas of caseation scattered through it. A definite capsule of fibrous tissue separated it from the remainder of the liver. The portal vein contained a thrombus which was undergoing organisation. The spleen was considerably enlarged and the capsule was irregularly thickened. There were numerous infarcts, and general fibrosis and congestion were present. The heart was slightly enlarged; the muscle was very flabby, and the mitral valve admitted four fingers. The first few inches of the aorta showed thickening of the intima in the form of nodular swellings and irregular, longitudinal folds of a whitish appearance. These changes extended into the coronary arteries. The lungs showed some congestion at the bases, and there was a small area of caseation surrounded by fibrous tissue in one apex. The kidneys showed slight interstitial and parenchymatous changes. The stomach was normal.

A Wassermann reaction had not been performed, but the condition in the aorta was typical of syphilitic aortitis, and the nodular mass in the liver was obviously a gumma.

The chronic course of the disease, the enlarged spleen, the profound anæmia, the severe attacks of hæmatemesis, and the ascites which were present in this case bear a striking resemblance to the clinical features of Banti's disease.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

Textbook of Tracheo-Bronchoscopy (Technical and Practical). By Sanitätsrat DR. M. MANN—translated by A. R. Moodie. John Bale & Sons & Danielsson. 31/6 net.

THIS is a translation from the original German edition which appeared in 1914. The main divisions of the book are two. The first is devoted to the technique of the subject, including an historical section describing the earlier efforts at direct examination of the larynx and lower respiratory system, also the gradual evolution of the instruments employed. It is to be noted that no reference is made to work in tracheo-bronchoscopy in Great Britain nor to any original designs in the perfecting of instruments. The methods of carrying out examinations are thoroughly gone into, and in this respect the book will prove of definite value to all those practising this branch of specialisation.

The second part is devoted to the practice of tracheo-bronchoscopy, the text being built up largely of case histories. Each branch of the subject contains extensive bibliographies. The extraction of foreign bodies is carefully classified and illustrated by cases, occupying about a third of the book. Diseases and tumours of the trachea and bronchial system are considered at length, also the changes in these parts resulting from conditions in neighbouring tissues.

The text and illustrations are clear, and the book can be fully recommended as a complete encyclopedia and atlas of tracheo-bronchoscopy.

Atlas de Syphilimétrie. By DR. ARTHUR VERNES, Paris
Librairie Félix Alcan. 35 francs.

THIS work, the author of which, as Directeur of the Institut Prophylactique de Paris, is actively concerned both with the clinical and the laboratory sides of the problem of syphilis, is one which we can thoroughly recommend to all who are interested in the diagnosis and treatment of that disease. It is an exposition of the practical uses of what the author terms "la syphilimétrie." By this he means the controlling of treatment of syphilis by his serological test, the "reaction

of Vernes." Despite the author's repeated protests to the contrary, we cannot convince ourselves that his reaction is fundamentally different from that of Wassermann, although the theory of it is. The author was one of the first to demonstrate that the Wassermann test depends not on any true antigen-antibody reaction, but on the flocculation which a syphilitic serum causes in a suspension of very fine granules such as that produced by the mixture of an alcoholic extract of heart muscle with saline. The author based his test on this flocculation and on the fact that flocculation, in the case of a syphilitic serum, is prevented by the presence of complement, the activity of the complement as an essential ingredient of hæmolysin being destroyed. Just as in the Wasserman test, the presence or absence of active complement is shown by adding red blood cells to the mixture and noting whether hæmolysis has been produced and, if so, to what degree. The reaction of Vernes differs, however, from that of Wassermann in that every stage in the technique is perfectly controlled. He insists on the most absolute exactitude in every step taken and, in consequence, he is able to give value to each serum tested corresponding to the strength of the reaction obtained with it. On the author's scale the figure " 8 " corresponds to a negative Wassermann test and " 0 " to a full positive. Between these two lie seven values.

Relatively more space has been devoted in this review to the question of Vernes' test than the author gives to it in his book, for it has been felt that some possible readers, whose interests are chiefly clinical, might be rather frightened by the title and the introduction of what, to them, would be a new and difficult laboratory test. We would emphasise, however, that if the book is read understanding merely that 8 means W.R. negative, 7 faint positive, and so on to 0, strongly positive, no difficulty will be experienced by the clinician in following the author's argument.

The greater bulk of the work is composed of a number of charts illustrating the course of treatment of patients. One chart is devoted to each patient, and on it a space is given for each week in the year. The treatment and the result of the tests of the serum and of the cerebro-spinal

fluid are plotted on the chart. Some charts illustrate the rise of the reaction from 8 to 0 during the development of the disease, and then its fall back to 8 under the influence of treatment. Charts of patients are chosen to show the various types, those who respond quickly to arsenical preparations and those who seem almost completely resistant. This work may seem new, but Vernes has devoted many years to it, and the fact that charts of several patients extend over seven or eight years shows that it is not to be regarded as merely an interesting novelty. Vernes is emphatically hopeful as regards the curability of almost every syphilitic. He shows some charts of patients in whom three years' treatment was necessary before the required 8 was permanent. In one case the patient received 170 injections before he was pronounced cured.

With regard to treatment, Vernes believes in the usual arsenical preparations, supplemented where necessary by mercury. We believe he is correct in saying—"La formule du traitement de la syphilis ce n'est pas la dose, c'est le rythme." That is an occasional dose is not likely to do much good: it may even do harm, since a too feeble dose or a series of doses spaced too widely apart may exercise a provocative action. What is necessary is a moderate dose given at absolutely regular intervals. The regularity is the important factor in treatment. One *mot* of the author's which pleads for thorough treatment is worth recording—"Il faut faire trop pour faire assez."

That most difficult problem, of when one can pronounce a patient cured, has been faced by the author, who has formulated what he calls the "Law of the three 8's." In his ten years' experience it has never been found to lead to error, although many cases have been followed up for a number of years. The law is that if a patient's serum gives a result 8 for 8 months after the last treatment, and his cerebro-spinal fluid gives the same result at the end of that time, he is permanently cured.

All those clinicians who treat syphilis should read this book. Even if one does not agree with everything the author says, it will be found interesting and most stimulating.

J. W. B.

General Pathology; an Introduction to the Study of Medicine. By HORST OERTEL, Strathcona, Professor of Pathology at McGill University, Montreal. Paul B. Hæber. N.Y. 1921. Pp. xxi+357—"A Record of the Combined Efforts of all Nations to arrive at the Truth in one branch of Science"—such are the title and the dedication of this book. Both are equally attractive, and the matter of the book in no way belies the promise.

FROM the outset Prof. Oertel approaches the problems of his subject in a purely scientific spirit, determined to arrive at the truth, and prepared to accept the finding, regardless of any preconceived ideas about it. To him all suggestions of "design" or "purposiveness" in physiological or pathological processes are beside the point, misleading, and unworthy of consideration.

The very term "immunity" offends him, because it suggests an "object" attempted or achieved—whereas it is merely a "state" which eventuates from certain antecedent conditions, part of Nature's endowment of the organism. In his own words, "a teleological conception of immunity as a primarily purposeful, useful, and protective institution cannot be entertained."

To inflammation, commonly regarded as a protective agency, the same remark applies. He states facts and things happen, whether for good or evil. And yet these two chapters on "Immunity" and "Local Cell Relations" stamp the book with distinction. They are full of philosophic thought and close reasoning.

The chapter on Immunity plainly shows that the final elucidation of its secrets will lie with the mathematician and the bio-chemist. The value of Ehrlich's great concept lay in the fact that it visualised abstruse and supposedly chemical reactions, and the theory fitted the facts as far as he knew them. But to borrow a quotation from the author, though in another sense—"πάντα ῥεῖ"—and Ehrlich's theory now goes to join Dalton's theory of atoms—exploded by the ion, and by the known facts concerning surface tension and ad-sorption. Hæmolysis, complement fixation, phagocytosis, and chemiotaxis, are not chemical or vital, but physical functions.

The author makes free use of the historical method, and by a judicious handling of the great historic landmarks in Pathology and Immunology, he shows something of the evolution of his subject, one of the soundest methods of making a subject understood.

For such a purist as Prof. Oertel it is curious to note that he speaks of an inflammation "healing," in the sense of recovering. Surely inflammation is a *process* which leads to one termination or another, and the *part* heals or fails to heal. It is a pity, too, when he thinks it worth his while to touch on Etymology, that so many weird derivations should have been allowed to stand in the text. Such lapses as the derivation of anaphylaxis from the imaginary word "ἀνάφύξις = unguarded," "ἀ-τροφία amphy-mixis, hydrophylic "παντα σει"—have no right to appear in a work of this calibre. The Greek character may have been too much for the printer, and these errata will, no doubt, be corrected in the next edition. The book is otherwise well brought out, and is far more free from misprints than American books usually are. There is no shine on the paper, and the type is beautifully clear and easy to read. We look forward with interest to the second volume on Special Pathology.

W. B.

ABSTRACTS OF CURRENT LITERATURE.

GIBSON, A.: *Facial Paralysis*. "Surgery, Gynecology and Obstetrics." November, 1921.

IN this paper Gibson, after a short description of the anatomy of the facial nerve, gives a detailed account of its various lesions, which may produce paralysis, laying special stress on the association of facial paralysis with suppurative disease of the ear. On the question of treatment he discusses plastic operations with great brevity, showing that they are chiefly useful in cases where all other forms of treatment, including nerve anastomosis have failed, and that even if successful, their remedial effect is slight, and not to be compared with the results obtained from nerve anastomosis. The author of the paper gives a brief but detailed history of nerve anastomosis for facial palsy, and reports eight cases on which he has operated with beneficial results. Five cases of paralysis resulted from a radical mastoid operation, one from a gunshot wound. In one case the origin was doubtful, probably inflammation in the neighbourhood of the internal auditory meatus. In the last case the operation was performed not for a facial palsy, but for a very severe facial tic. Seven of the operations have been performed long enough to allow him to state the results; in six it was very good, complete recovery of the face at rest, so that it was difficult or impossible to distinguish the paralysed side, and considerable recovery of voluntary power of movement. The other case showed considerable improvement of the expression of the face at rest, but only slight voluntary movement. In this case the facial nerve divided very soon after its exit from the stylomastoid foramen, and the trunk of the nerve was distinctly swollen, pinkish, and soft, so that a bad prognosis was given; in addition the wound became septic in its upper part, owing to infection from an unhealed operation scar, made a short time before for the original ear trouble. The case of facial tic was only operated on in February, 1921, and at the time of writing it was too soon to state what the final result would be, beyond the fact that the tic was completely relieved. The operation advised is that of anastomosis of the hypoglossal to the facial, and a very full and careful description of the operation is given, the only point in this which might be questioned is the advice to divide the hypoglossal nerve on the tongue muscles after it has given off the branch to the thyro-hyoid and the cutting of this branch in order to allow the nerve to be turned up and anastomosed without tension. This very distal section of the nerve would appear to be unnecessary, as the anastomosis can be performed without tension after section above the thyro-hyoid branch as a rule, and in all cases if the posterior belly of the digastric is divided. By this proximal section,

the operator has a larger nerve to use in the anastomosis, and if the suggestion of Ballance is adopted of uniting the cut end of the descendens hypoglossi to the distal end of the hypoglossal, both the tongue muscles and the thyro-hyoid may again be linked up with the brain. In none of his cases did Dr. Gibson apparently attempt this additional anastomosis. However, as he points out, the resulting paralysis of one-half of the tongue leads to no noticeable defect, though the atrophy of the tongue was quite evident to sight. As the author points out the expression of the emotions by the features are all the result not of simple contractions of simple muscles, but extremely complex movements involving many muscles in different degrees, and, therefore, though after operation there may be complete recovery of the face at rest and even good voluntary movement of the individual muscles of the face, yet the recovery of emotional expression is usually rare or very imperfect. Prognosis in this respect varies with the age of the patient, the younger the case the better chance for recovery, which necessitates re-education, and is probably dependent on the actual formation or development of association fibres between the facial and hypoglossal cortical centres. The close proximity of these centres in the cortex being a further point in favour of the advantage of the hypoglossal in preference to the spinal accessory for the purpose of anastomosis.

R. A. STONEY.

LOCKWOOD, A. L.: *Subdiaphragmatic Abscess.* "Surgery, Gynecology and Obstetrics." November, 1921.

THIS paper is founded on 82 cases diagnosed during life and 31 cases found at autopsy. Approximately two-thirds were the result of soiling from a viscus within the abdomen, either before or following operation, one-sixth were the result of extension from an adjacent abscess, and one-sixth were the result of distant foci of infection. The author advises a special technique for operation to open one of these abscesses through the chest wall. The incision is made through the 9th, 10th or 11th intercostal space, and the ribs are spread without section, this is to avoid infection and consequent troublesome osteomyelitis. The cut intercostal muscle and pleura is then stitched to the diaphragm at upper and lower borders of the incision, and then the skin is stitched to the diaphragm in the same way, and the edges smeared with vaseline before the diaphragm is incised and the abscess opened. In this way infection of the cellular tissues and muscular pleura is avoided. A lighted retractor is used to carefully inspect the interior of the abscess, after it has been emptied, in order to avoid overlooking a pocket or a second abscess; and the parts are palpated to make sure that there is not an underlying abscess in the liver.

The following conclusions are drawn:—

1. Subphrenic or subdiaphragmatic abscess is a grave condition and causes a high mortality. The convalescence of patients who recover

is long, tedious, and accompanied by serious complications, such as renal and thoracic lesions, which often leave the patient a chronic invalid.

2. The serious sequelæ of the disease are due to the fact that the condition is not recognised sufficiently early, or is not dealt with promptly and completely.

3. The condition is secondary to infection elsewhere, and a high percentage of cases follows upon upper abdominal infection at operation or postoperatively.

4. Gravity accounts for the selection of the subphrenic area in the development of abscesses following abdominal soiling.

5. Every effort should be made to prevent soiling of the subphrenic area during upper abdominal operations, and drainage, particularly of the upper abdomen, should be employed only when absolutely necessary.

6. Subphrenic abscess should be suspected in all patients, who, following abdominal operations, maintain for no obvious reason, an elevation of temperature and pulse.

7. X-rays should be employed as an early diagnostic aid.

8. Needling for diagnosis is a dangerous practice, and should be used only to rule out pleural effusions. The needle should not be passed through the diaphragm into the abscess until the patient is on the operating table, and then if pus is located, the needle should be left in position, and the operation carried out without delay.

9. More deliberate and protracted operations can be performed with minimum risk to these emaciated and seriously ill patients under paravertebral anæsthesia than under general anæsthesia.

10. A wide exposure of the abscess area is necessary.

11. Efficient drainage must be secured.

R. A. STONEY.

NIXON, J. A.: *Progress in the Treatment of Empyema*. "Bristol Med. Chirurg. Jour." September, 1921.

THIS author says that there appear to be certain points in the treatment of empyema which are accepted almost without question, and he thinks that they stand in the way of progress. For instance: 1. Resection and drainage are held to be fundamental principles governing the treatment of empyema. 2. The object sometimes aimed at in operating is the falling-in of the chest wall on the unexpanded lung rather than the rapid re-expansion of the lung to the chest wall. 3. Washing out of the thoracic cavity is considered dangerous because of "pleural shock." 4. Collapse of the lung is thought to depend upon air pressure inside and outside the thorax. 5. It is believed that after operation expansion of the lung can be obtained by breathing exercises irrespective of the condition of the pleura. 6. Decortication of the lung is regarded as essentially a late procedure, instead of being resorted to whenever possible at the primary operation. 7. Estlander's operation for thoracoplasty is not yet considered a belated confession of a series of therapeutic failures.

If Dr. Nixon's indictment is true, we can only suppose that his surgical colleagues are very much behind the times. Modern surgeons do not remove extensive portions of several ribs in acute empyemas, every surgeon will admit that an Estlander's operation is only required in old chronic empyemas which have usually reached that stage from faulty early treatment. No surgeon attempts to make the chest wall fall in if there is a good chance of obtaining expansion of the lung. Surely it is only physicians who are afraid to wash out the pleura owing to the danger of "pleural shock." Dr. Nixon believes "a time will come when open drainage of a chest will be regarded as a surgical abomination, if it seems necessary to drain a chest temporarily, the aim should be to close it as soon as possible." Quite so, as soon as suppuration has ceased. "Under no circumstances should a sucking wound be left," again we agree, but this does not forbid the use of a drainage tube, if the tissues are tightly stitched around the tube, and a moist dressing applied, there is no "sucking wound." He states "there may be good reason for not irrigating the pleural cavity, as there is for not irrigating the peritoneal cavity." The reason for not irrigating the peritoneal cavity is that owing to the complexity of the peritoneum it is useless, and a localised infection (as peritonitis frequently is) may be made general. The pleural cavity is a simple one, and infection in empyema is usually general, the cavity, therefore, can be washed out with advantage and without danger. Dr. Nixon advises extensive opening of the pleura, but without rib resection, and exploration of the cavity with the hand, and even delivery of the lung on the surface, "decortication should be aimed at during the primary operation, as then it is a simple operation," this we can easily imagine, as if the operation is performed at a reasonably early stage there is probably nothing to decorticate, at most unorganised fibrin which is easily dissolved and removed by daily douching. "Tuberculous empyemata are unsuitable for operative measures which are at present scarcely out of the experimental stage." Dr. Nixon does not suggest how they should be treated. Does uncomplicated tuberculous empyema occur? The author makes an analogy between the treatment of empyema and appendix abscess, and states that the use of a drainage tube for the latter is now rarely resorted to. No doubt some appendix abscesses may be cleaned out, and the abdomen completely closed, but the experience of most surgeons is that these are the exception rather than the rule, and an appendix abscess containing, perhaps, 1 dram and certainly less than 1 ounce of pus (which are the only ones to which this treatment is applicable) differs fundamentally from a pleural cavity containing one or several pints of pus. We are quite in agreement with his plea that ultimate restoration of function should be aimed at, as well as immediate saving of life. But we believe that this end will be more surely gained by early limited opening of the chest, combined with flushing out of the pleural cavity, the use of a drainage tube with suture of the tissues in layers around it,

daily douching with hypochlorite solution, and the early use of respiratory exercises. By these means the majority of empyemata may be cured within a month.

R. ATKINSON STONEY.

MOYNIHAN: *Gastric Ulcer and its Treatment*. "Medical Record." May 28, 1921.

A MASS of inaccurate and misleading literature has been gathered round the subject of gastric ulcer. While being represented as common, it is really uncommon, and its symptomatology is so closely mimicked by other conditions that the diagnosis, instead of being easy, is, by the ordinary methods, exceedingly difficult.

The anatomical landmarks which separate stomach from duodenum *i.e.* the pyloric vein of Mayo, and Moynihan's "white line," are so definite that there is no excuse for confusing the location of an ulcer. M. finds the proportion of duodenal to gastric ulcer to be 5:2.

The classical symptoms of pain, vomiting and hæmatemesis, require careful analysis if one is to reach a correct conclusion. *Pain*—is characterised by its regularity. During the period of attack, it occurs after all meals, invariably. In gastric ulcer it begins, within $1\frac{1}{2}$ hours of the taking of food, the interval being shorter, the nearer the ulcer is to the oesophagus; it has generally subsided before the next meal is due. The sequence, therefore, is *food, comfort, pain, comfort*. In duodenal ulcer, pain begins 2 or more hours after food and generally lasts until the next meal is due. The sequence, here is, *food, comfort, pain*.

Complications such as stenosis, subacute perforation or adhesions may delay the onset of gastric or hasten that of duodenal pain. In many cases pain is felt on the left side and high in the epigastrium, but when a chronic ulcer has eroded the pancreas, the patient not infrequently complains of an intolerable ache in the back.

Vomiting—is conspicuous unless cicatrization of an ulcer has occurred with consequent obstruction.

Hæmatemesis—while it undoubtedly occurs and may be profuse, is really infrequent and may be due to such other affections as splenic anæmia, cirrhosis of liver, appendicitis and toxic abdominal conditions, all of which should be primarily investigated.

Radiography is, in expert hands, the one certain method of pre-operative diagnosis.

Of *chemical methods* M. speaks without enthusiasm, as hyperchlorhydria may be due to so many other causes that its presence is of little value.

Physical examination in the absence of obstruction, yields little information, but all cases have epigastric tenderness which can almost always be elicited, if an ulcer crater is seen during *x-ray* examination, by direct pressure on the ulcer area.

So many other abdominal conditions, *e.g.* cholelithiasis, appendicitis—express themselves primarily in terms of gastric disturbance, that

needless and harmful operations (gastro-enterostomy) have been performed on the stomach when the disease was really located elsewhere. To avoid this calamity, if direct inspection of the stomach at operation fails to show any sign of an ulcer, and if in addition any of the following signs are observed, *i.e.* pyloric blush, spasm, enlarged glands along the greater curvature, then one may confidently predict that the stomach itself is healthy, and that the appendix or one of its neighbours in the alimentary canal is diseased.

Finally Moynihan states his own strong feeling that no diagnosis of chronic ulcer should be confidently accepted unless the ulcer is diagnosed by *x-ray* examination or is displayed upon the operation table.

Surgical Treatment.

I. *Gastro-enterostomy*.—Good results follow this operation only when the stoma is proximal to the ulcer, and the pyloric region is the seat either of cicatricial stenosis or of obstructive spasm. It should not be performed if there is any doubt as to the malignity of an ulcer.

II. *Excision*.—Owing to its many disappointments—gastric deformity, relapse of ulceration, crippling adhesion—Moynihan has abandoned the operation altogether, in cases of gastric ulcer.

III. *Gastro-enterostomy combined with (a) Excision, (b) Cauterization*. Balfour's method of destroying the ulcer crater by the cautery has replaced excision in these cases—being simpler, safer, more effective and less destructive, and has proved itself one of the best ever devised in the treatment of this disease.

IV. *Gastro-enterostomy combined with jejunostomy*.—Moynihan has employed this method with excellent results in very grave cases. Such cases may be unsuitable for Balfour's operation by reason of the size, remoteness or deep perforation of the ulcer, and for gastrectomy by reason of the extremely feeble condition of the patient. His method is as follows: The jejunum is divided 12-15 inches below the flexure; its distal end is closed and anastomosed to the anterior stomach wall. The proximal end of jejunum is now anastomosed to the side of the distal limb a few inches below the gastro-enterostomy opening. Into this proximal limb a tube is introduced and fixed by Witzel's method. This tube passes through the entero-anastomosis into the jejunum for several inches and through it all nourishment is given for months or years until an *x-ray* examination shows that the ulcer is healed.

V. *Sleeve resection* has almost always been followed by contraction at the suture line, and is one which he has not performed for many years.

VI. *Partial gastrectomy*.—Is the operation of choice in suitable cases. The risk, over 10 years, is less than 2.5 per cent. If for any reason it is contra-indicated—such as a very feeble patient or a very extensive ulcer unsuitably placed—the method of gastro-enterostomy *en Y* with jejunostomy, is to be preferred to all others. The results of gastrectomy, both immediate and remote, are excellent.

In two cases only, slight bilious vomiting, due to kink at the upper end of the anastomosis, occurred. To avoid this he now divides the jejunum and makes an *en-Y* anastomosis with satisfactory results.

A short table is appended of 910 operations for gastric duodenal and jejunal ulcer since 1909, with 12 deaths or a total mortality of 1.3 per cent. There were 96 cases of gastrectomy with 2 deaths, a mortality of 2.08 per cent.

CHARLES MACAULEY.

BRUTT: *Radical or Conservative Treatment of Perforated Gastro-duodenal Ulceration?* "Ztbltt. f. Chir. 1921, 38, p. 1378-1382."

WITH the increasing use of more extensive operations for the relief of chronic ulceration, it has of late years been recommended that such methods should be applied to the ulcer of recent perforation, if the patient's condition be sufficiently good to warrant the attempt being made.

Up to quite recently, the accepted method of dealing with these acute cases has been the enclosure of the ulcer, followed by posterior gastro-enterostomy. In Kummell's clinic, out of 140 successive cases, so treated, a total mortality of close on 40 per cent. was recorded. Of 58 cases, who returned for subsequent examination, at intervals of not less than one year after operation, no less than 12 per cent. had still pronounced symptoms of an active lesion; in the majority, the main post-operative trouble was a recurrence of severe hæmorrhage (5 cases). Such hæmorrhage might arise from (a) the original perforating ulcer, (b) a jejunal ulcer, or (c) a secondary ulcer, present at the original operation. (Of 50 fatal cases of primary perforation, autopsy demonstrated multiple ulcer formation in 18 cases.)

To justify the general use of the more extensive procedures in cases of perforation, two conditions should be fulfilled: (1) the operative mortality should not be much higher than with the usual conservative methods, and (2) the end results should be better, to balance a slightly higher mortality.

B., in 12 recent cases of pyloric ulcer-perforation, has carried out resection of the ulcer area, with only one fatality. All were men; all operated on in the first 6-24 hours. In only 4 cases was the peritoneal exudate sterile. In every case, the peritoneum was closed without drainage, a point on which B. lays particular stress. In the one fatal case, the peritoneal exudate showed a pure culture of a hæmolytic streptococcus, at operation 6 hours after perforation. A bacteriological examination of the peritoneal exudate is of distinct prognostic value.

In the eleven successful cases, convalescence was uneventful; as all have been operated on since June, 1920, it is as yet too soon to speak of end results.

Resection is not to be recommended in all cases of recent perforation; the one indispensable requisite is that the patient's general condition be good.

WM. DOOLIN.

EUSTERMAN (Mayo Clinic): *Late Sequelæ of Surgery of Benign Ulcer of Stomach and Duodenum*. "J.A.M.A., October 15, 1921. Pp. 1246, 1250."

POSTERIOR gastro-enterostomy, with or without knife or cautery, has been the usual treatment at the Mayo Clinic. They agree with Moynihan that the chief reason for failure comes under one of the following headings:—

1. Performance of operation in absence of intrinsic lesion. .
2. Faulty technique (vicicous circle, too small stoma, too long jejunal loop.)
3. Leaving behind a diseased gall bladder, or appendix at the time of an otherwise successful operation.
4. Formation of a new ulcer; re-activation of an old one; or development of carcinoma on ulcer site; perigastric adhesions.

In the Mayo's cases, operation showed 88 per cent. of cures. A properly formed gastro-enterostomy, in the presence of an indurated pyloric or duodenal ulcer is a splendid physiological procedure. Radiography (Carman) has shown (1) the stomach is usually smaller than before operation, unless marked dilatation was present previously: (2) the stomach empties in considerably less time than the normal unoperated stomach, and (3) the opaque meal passes freely through the stoma, which does not tend to contract materially.

The Mayo Clinic does not regard pyloroplasty favourably, as compared with gastroenterostomy. 15 per cent. of pyloroplasties "eventually prepare a rich soil for a highly successful gastro-enterostomy."

Medical treatment, on Sippey's lines, is not to be decried. Consistent medical treatment is superior to poor surgery, and its mortality is practically nil.

WM. DOOLIN.

GLENDENNING: *Unfavourable Results following Gastro-enterostomy*.

"Jo. Am. Med. Ass." October 15, 1921. Pp. 1241-1246.

WHAT is the physiology of the stomach after a gastro-enterostomy has been done? In all cases, the food is seen to pass through the stoma, by the fluoroscope; the more marked the pyloric obstruction, the more passes through the stoma. The average emptying time of the stomach through the anastomotic opening is $2\frac{1}{4}$ hours (6 cases tested). In general, the secreting activity is lessened, as compared with the preoperative condition. Where pyloric obstruction has been present, patients gain markedly in weight. It is a satisfactory operation if properly carried out, in proper cases. The most favourable cases are those of pyloric ulcer stenosis; the least favourable cases are indurated ulcers far away from the pylorus. The causes of later unfavourable symptoms developing after gastro-enterostomy are: (1) jejunal ulcer; (2) recurrence of the gastric ulcer, particularly in posterior stomach wall; (3) diarrhoea (too rapid food exit, or sepsis); (4) jejunal dilatation (too large a stoma); (5) gastric stasis (too high implantation of stoma); (6) development of later carcinoma.

WM. DOOLIN.

TRANSACTIONS.

TRANSACTIONS OF THE ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF OBSTETRICS.

November 4th, 1921.

THE Obstetrical Section of the Royal Academy of Medicine in Ireland met on November 4th, 1921, the newly-elected President (DR. BETHEL SOLOMONS) in the chair. DR. SOLOMONS read his inaugural address on "Some Aspects of Sterility." He dwelt on the necessity for supporting the Academy of Medicine which was the chief mouthpiece of affairs obstetrical [inside and outside Ireland. If gonorrhœa and tuberculosis could be stamped out there would be very little sterility to contend with. Faulty function of the ductless glands, especially of the corpus luteum, was a frequent cause, and the internal administration of corpus luteum was often successful in effecting cures. Stenosis of the cervix should be treated by dilatation with Hegar's dilators. Posterior division of the cervix should be avoided in most cases as it was usually so malperformed that a scar was left from which leucorrhœa constantly poured. Tubal disease was the most common and the most overlooked cause of sterility. The President suggested a classification of tubal disease with special reference to sterility. Often it was impossible to diagnose any gross trouble until the abdomen was opened, and he put forward a plea to operators to perform laparotomy in all cases of sterility where the male was normal.

MR. L. G. GUNN thought that there was some confusion between sterility and impotence. "A man might be sterile yet potent, and vice versa. Speaking from his experience of sterility in males who were potent, he found that there were three causes of sterility:— (1) Masturbation: He believed that no bad effect followed juvenile masturbation, but certainly masturbation at a later period was a common cause of sterility. (2) Fraud: by which he meant the limitation of families. Whatever means were adopted, it made the patient mentally nervous, and caused prostatic congestion, with the result that sterile fluid was ejected. (3) Gonorrhœa. In fifty per cent. of males this infection reached the posterior urethra, and causes damage to the genital system. A condomal specimen should always be examined, when the living spermatozoa could be seen. Under normal conditions these should live for six hours; if they survived for less, the subject was less capable. Slowly-moving or rapidly dying spermatozoa were very unfavourable. He (Mr. Gunn) had also noticed that abnormalities in size and shape of the

in getting the male to subject himself to examination, and he did not believe that if the male were found to be blameworthy it would bring unhappiness to the home; it was far better than subjecting the woman to an unnecessary operation.

PROFESSOR GATENBY said that from the zoological aspect little was known precisely. Self-sterility in the lower organisms varied greatly. In certain ascidians the alteration in toxicity of the salts upset the normal ratio. Also in heterogeneous hybridization one could also alter the proportion of fertilizations in echinoids by altering the calcium content of the water. In all animals, sterility might broadly fall into two classes:—Improper activation of the egg; and incomplete introduction of the necessary hereditary factors.

Regarding the human ovum, segmentation was now known only in part. The segmentation of the human ovum was probably much the same as in lower animals. The development of human ova up to four cells might be parthenogenetic without entry of spermatozoa. Spermatozoa were not necessary for segmentation. Parthenogenesis in the human species showed that the egg needed very little activation to begin development. A mammalian spermatozoon might be fully formed and yet immobile. Many experiments had been made—but so far very few properly conducted—to mobilise these spermatozoa. Double-tailed spermatozoa were common, and were caused by precocious division of the spermatid centrosome.

Some aspects of sterility one was unable to explain, but there was a possible method of attack in the study of protein and lipid metabolism.

DR. FEARON agreed with Professor Gatenby, with regard to the chemical aspect of sterility, that the cell enlarged by both physical and chemical changes. He found that acids had a great effect in stimulating the ovum to sub-divide. He agreed with Professor Gatenby that an ovum would develop under suitable circumstances without the assistance of a spermatozoon. In cases of sterility, he thought that the blood of the male, and the semen also, ought to be examined by a bio-chemist.

SIR ANDREW HORNE thought that Dr. Solomons' paper divided cases of sterility into two varieties:—(1) Women in whom all the organs were apparently healthy; (2) women in whom some organs were diseased. He was much interested in Mr. Gunn's remarks, particularly that one should know the past history of the husband. That was difficult for the gynæcologist, without arousing the suspicions of the wife, because the main cause of sterility in the male was gonorrhœa. The whole question of sterility was mysterious. He had had a case of a patient who was six years married and sterile, and then pregnancy occurred without any interference. There was no doubt that impregnation followed dilatation, but the dilatation must be done within a time limit, say from 20 to 30 years of age. When the gynæcologist found evidence of disease, it was his duty to do something. Gonorrhœa was the most important infection, and tuberculosis was rarer than was supposed. He had

no experience of tubal operations, but he believed that in some cases they were successful.

DR. TWEEDY congratulated Dr. Solomons on bringing to the meeting two non-gynæcologists, as their views could not fail to be beneficial to the Obstetrical Section. He thought we must look in the future to such biologists as Professor Gatenby and his co-workers for our information regarding fertility and sterility. Mr. Gunn interested him in his remarks regarding male sterility, but that raised a very important social question, viz., the happiness of the home. He (Professor Tweedy) thought it would prejudice that happiness if the wife—through her physician—had reason to suspect her husband's virility. Dr. Solomons was right when he said that in fifty per cent. of cases of female sterility, where dilatation had failed, the abdomen should be opened, when in most cases, a cause would be found. It was not always in the tubes. In some cases no Graaffian follicle was to be found in the ovary. In cases of salpingitis, he had found overstitching of the tube to the ovary to be useless, as catgut stitches in the tube caused an exudation, which formed a membrane between the tube and the ovary, consequently the tube was really closed. Regarding resection of the tube, or implantation of the tube into the uterus, the important point was to have continuity of the mucous membrane, otherwise there was not a free passage for the ovum. Sometimes one found the tubes very long and narrow. In such a case the tubes should be blown up with air, and cut where the air dilatation stopped. The outer portion of the tube should then be implanted into the mucous membrane of the uterus. Dr. Tweedy described the operation as practised by himself, and showed the tubal needle which he employed. He disagreed with Dr. Solomons that tuberculous tubes were hopeless. He thought that if the tubes were resected, and strands of catgut inserted in the lumen, there was, at any rate, hope. A large number of tubercular patients were cured by operation.

SIR JAMES CRAIG, THE MASTER OF THE ROTUNDA, and DRs. CROFTON and TOTTENHAM also spoke.

He thought Professor Gatenby's suggestion of inserting in the vagina some form of pessary containing prostatic secretion with a view to activating immobile spermatozoa a most reasonable one. When he said that the operation of dilatation and curettage was often followed by disastrous results, he meant to convey that it was often done at the wrong time in the wrong patient by the wrong operator. When absolutely necessary it was useful when skilfully performed. He did not think it wise to stitch the ovary to the tube. He thought it possible that a small piece of functioning ovary might be resected and placed within a dilated tube. It was sometimes necessary to overstitch a tube to stop hæmorrhage. He would not remove a piece of tube because it appeared too long. When generalised abdominal tuberculosis was present the case was hopeless, but when the disease was localised in the tubes they could be resected.

The PRESIDENT in reply said that where no gross disease was palpable in the abdomen the semen must be examined before laparotomy was recommended. He had never found any difficulty spermatozoa were unfavourable for fertility. The treatment of such cases in the male did not hold out great hope, but he was strongly of opinion that before operating on the wife for sterility, one should make certain that the husband was potent and fertile.

THE Obstetrical Section of the Royal Academy of Medicine in Ireland met on December 2nd, the President in the chair.

Fibromyoma of the Ovary.

THE PRESIDENT showed a fibromyoma of the ovary. It was removed from a patient aged 50, married 29 years, ten children, no abortions. Last pregnancy November, 1914. Although 50 years of age she was still menstruating, and the menstruation had lately become greater in amount. She complained that for four years she had suffered at intervals of three or four months from pains in the left side which were as severe as those of labour, and which lasted for from 2 to 3 hours. The intervals between the pains had been diminishing, and their duration had increased.

At operation a solid tumour of the ovary, involving the whole organ, was removed without difficulty. It seemed osseous in consistence and weighed two pounds. The pathologist, Dr. Pollock, reported as follows:—

“An entirely solid tumour showing marbled areas composed of vascular points alternating with non-vascular areas. There is a necrotic zone the size of a two shilling piece at the surface at one point. The histological structure is that of a fibro-myomatous growth of a richly cellular nature. There is no suggestion of malignancy.”

The tumour was brought before the Section as a rarity. Frankel classified it as stromatoid. According to many authorities ascites was a constant accompaniment of the condition, but it was not present in this case. He (Dr. Solomons) regarded the presence of ascites as pointing to malignant degeneration in the tumour. The pains from which the patient suffered at intervals were probably due to twisting of the pedicle.

Obstetrical Shock.

DR. HASTINGS TWEEDY read a paper on Obstetrical Shock. He said that Dale and other workers had conclusively proved that a poison generated in bruised muscle was a potent factor in obstetrical shock. Other protein material could generate this poison and obstetricians had every opportunity of observing that it could arise in freshly effused blood. Ruptured tubal pregnancy, concealed accidental hæmorrhage, and hæmatoma of the vulva all supplied evidence of this fact. Liquid blood was more poisonous than that which was clotted and thus hæmatocele could be accounted for.

If the woman survived the initial toxic dose the blood would have time to clot. Shock was associated with a general elongation of all muscle fibres. The pupils, the anus, the bladder, the intestines and the cheeks demonstrated this. The veins, and at a later stage the arteries, seemed to be also affected. Indeed a great dilatation in the capillaries and veins might account for the phenomena of shock. In the uterus this elongation was better demonstrated than in any other organ, and the condition was evidently one of "retraction reversed." Contraction, a temporary shortening of muscle fibre, was under the control of the nervous system, retraction was a property inherent to the muscle itself, it took place in a flabby inert muscle and was the chief factor in preventing hæmorrhage. The process was slowly reversed during the growth of a pregnant uterus and rapidly reversed in shock.

Accidental hæmorrhage was of toxic origin; if the blood did not quickly escape its products caused shock, which led to dilatation of the uterus. The condition was, therefore, not due to a diseased atonic uterus, and the fallacy of hysterectomy for its relief was apparent.

Cæsarean section with a smaller mortality was more effective in the control of hæmorrhage. Uterine inertia was no contraindication for delivery by forceps, for inertia was no bar to retraction. It was shock and not inertia that was to be dreaded.

Lastly the "retraction reversed" fibre was quite capable of contraction, and this was probably the condition found in the arteries during the early stages of shock.

SIR WILLIAM SMYLY said that the views propounded in Dr. Tweedy's paper would require much thought and research before one could either accept or reject them. If shock was the result of toxins in the effused blood they must develop with extraordinary rapidity and disappear almost as quickly. He remembered a case of ectopic pregnancy in the Rotunda Hospital which ruptured during a bimanual examination. There was profound shock from which the patient began to recover, as soon as the bleeding had been controlled by an operation, within an hour of the accident. In another case, owing to the apparently desperate condition of the patient, he had left all the effused blood in the abdomen without any evil consequences. He certainly agreed that the retention of the blood in cases of concealed accidental hæmorrhage could not be due to disease of the myometrium, because, as Doctor Gordon Ley had pointed out; the uterus was paralysed for a time only, and later recovered its power of contraction. Further he also believed that uterine inertia was not the commonest form of post partum hæmorrhage, which more frequently resulted from an imperfect separation of the placenta. If the views which Doctor Tweedy had advanced were proved facts they certainly would illuminate many things which at present were obscure.

MR. H. STOKES said that in gunshot wounds of the abdomen,

the veins were blanched, and he was not sure where the blood had gone to. Of course one got hæmorrhagic shock from hæmorrhage, but he would like to ask Dr. Tweedy how the shock from external hæmorrhage differed from that due to concealed?

DR. GIBBON FITZGIBBON said he could not see Dr. Tweedy's contention that it required an abnormal action of the muscle fibres to produce elongation in shock. Every muscle was normally in a condition of slight continuous contraction, which was known as muscular tone. If the afferent nerve supply of a limb was interrupted this tone was destroyed, and the limb lengthens, merely from the loss of the normal constant contraction. The primary hæmorrhage caused lowering of the blood pressure; if it was slow it was gradually compensated, but in the long run the limit of compensation was reached, and the further lowering of pressure resulted in anæmia of the centres, failure of compensation, and collapse. If the bleeding was stopped, compensation was gradually restored, and recovery was rapid. In the case of hæmorrhage into the peritoneal cavity, there was the irritation of the peritoneum to account for the shock, and this occurred irrespective of the amount of hæmorrhage and was seen in rupture of the intestine, twisted pedicle, etc. The shock here could be accounted for by splanchnic irritation depressing the cardio-vascular centres. That retraction occurred independently of contraction was always seen at Cæsarean sections, and seemed rather the inherent tendency of normal muscle when not under tension. In postpartum hæmorrhage, whatever might be the origin, the uterus became atonic, and continued to bleed till tone was restored. If restoration could not be effected the uterus was plugged to control hæmorrhage until the uterus had had time to recover.

MR. W. PEARSON regarded shock ætiologically as a complex phenomenon. He gathered that Dr. Tweedy's paper was concerned with those cases of "hæmorrhagic shock" following concealed hæmorrhage in which the shock was not chiefly dependent on the *amount* of the bleeding, whereas Mr. Stokes referred to shock which followed severe external hæmorrhage. Mr. Pearson spoke of Dale's experiments with histamine injections which illustrated the toxic origin of shock. During the war toxic shock was found to be produced by systemic absorption of substances from damaged muscle tissue rather than from blood clot, but whether the substance was histamine itself or some allied body was not clear. If, as Dr. Tweedy suggested, shock was due to the absorption of freshly effused blood, the site of the effusion must also be a most important factor. For example, in cases of limited "concealed hæmorrhage" (*i.e.* hæmatomata)—whether primary or secondary—into the limbs, one never found shock which could be attributed to the blood clot. On the other hand, in cases of ruptured tubal pregnancy the blood clot was intraperitoneal, and one found that intraperitoneal extravasation of sterile bile or urine was equally productive of shock.

On the whole he (Mr. Pearson) felt that though they knew many facts relative to shock, they did not yet know the ultimate mechanism of its production.

The PRESIDENT found difficulty in discussing the theories brought forward without more thought. While accidental hæmorrhage, as suggested by Dr. Tweedy, might always be due either to toxæmia or indirect violence, he wished to show why toxæmia should be diagnosed when albumin was absent from the urine, and there were no other toxæmic signs present. It was difficult to determine what teaching should be given to students, and how they would be expected to answer at examinations. He believed with some of the previous speakers that the cause of shock could not be laid at the door of any one factor; there were many such factors. He hoped that the subject would be more fully developed, and that the reason for the relief of shock by various drugs, especially morphine, would be explained.

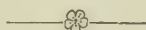
DRS. ENGLISH and ASHE also spoke, and PROFESSOR TWEEDY replied.

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“HÆMORRHAGIC SHOCK”; ITS
CAUSE, AND INFLUENCE ON
PREGNANCY.*

BY E. HASTINGS TWEEDY.

THE researches of Cannon, Bayliss, Wallace, Dale, Delbet, and Quenu have established the fact that a poison generated in injured muscle is capable, when absorbed, of producing profound shock. Dale remarks that these observers concentrated their attention upon muscle, but that it is not singular in its power of developing toxin, for bile and intestinal contents are highly active in this respect.

Now that our attention has been drawn to the subject obstetricians will have no difficulty in establishing the fact that freshly effused blood is also similarly toxic.

A woman swallows blood and is thereby profoundly collapsed, relief only coming after the stomach is emptied.

A patient suffering from ruptured tubal pregnancy is on the point of death with a loss of blood not comparable to that which is lost in many a normal child-birth.

Concealed accidental hæmorrhage with its comparatively

*Read before the Section of Obstetrics, Royal Academy of Medicine in Ireland, December 2, 1921.

small effusion is only diagnosed because of the terrible collapse it induces.

I have seen extreme shock accompany the formation of a hæmatoma of the vulva, and in a recent experience where a blood effusion collected beneath the skin of a fresh abdominal scar, the collapse became so profound that my junior Resident Staff felt themselves compelled to administer horse-serum, calcium, morphia, stimulants and the other prized remedies of the Pharmacopœia. It was not until a few clips were loosened and a clot about the size of a closed hand was removed, that the condition improved ; an iodoform gauze plug stopped further oozing.

It is needless to labour this point further, for the facts are patent to all observers, nor is there any other reasonable explanation to account for the conditions above cited.

Clearly, too, it is in freshly effused blood that the poison arises, for when clot forms, the condition becomes comparatively harmless. Thus we account for the formation of an hæmatocele. Its presence is proof that the woman has rallied from her initial shock.

In discussing the causation of shock it seems to me that little attention has been paid to one of its earliest and most marked characteristics, namely, the almost universal relaxation of the unstriated and, I think, of the striped muscles as well. In no other way can I account for the exaggerated inflation and drawing in of the cheeks during respiration in extreme shock. The pupils open, the anus relaxes, the intestines dilate, the bladder expands, and I believe it will be found that the veins are also affected. Dale and his co-workers have not been able to discover congestion of the large abdominal veins, and he by a process of elimination arrives at the conclusion that the blood which has, in a large measure, left the heart, the arteries and the veins, must stagnate in the capillaries.

At a later stage the vessel walls become pervious and permit the escape of plasma, thereby in all probability adding a further toxic element. This, however, does not account for emptiness of the vessels during the earlier periods of shock. Increase in the calibre of all the veins as well as the capillaries would quite well account for this,

and would also explain the absence of engorgement in the abdominal veins, for their increased capacity would make them appear comparatively empty, in spite of their containing an amount of blood not much less than their normal supply.

The heart, which might be expected to retract on its diminished contents, appears on the contrary to dilate or, at all events, to become dilatable ; many positive observations have demonstrated this fact, for instance, when saline infusion has been passed too rapidly into a vein.

. Saline leaves the vessels almost as quickly as it enters them, and it is inconceivable that a healthy heart could not withstand the strain.

The functions of the arterial muscles is to regulate pressure, and it might therefore be expected that they would be less easily diverted from this function than structures less highly specialized, and this is what seems to occur, for, at first, the arteries contract. The bounding heart, comparable to a clock without its pendulum, can rarely drive a pulse wave to the wrist, and thus its abnormal slowness can be accounted for. Finally, the arteries, too, dilate, and the pulse, now as rapid as the heart-beat, becomes abnormally compressible and more and more difficult to feel until it finally disappears completely.

If elongation of muscle is a condition of shock it should be present to a marked degree in the uterus ; this certainly is so in many instances, though I am not prepared to say in all. I have not observed the phenomena where the abdomen has been opened for the cure of tubal rupture. I have, however, never directed any attention to the matter, and have seized the uterus as a preliminary manœuvre, thereby effectually masking dilation did it exist. I know from personal observation that the lumina of both tubes are much enlarged in the portions far removed from the implanted ovum, and I think the uterus appears from within the abdomen to be larger than it feels by bimanual examination.

I shall now give concrete examples of uterine dilatation.

Many years ago Sir Andrew Horne and I were summoned to help a practitioner who had become unnerved during the

removal of an adherent placenta. Whilst completing the operation, I found the uterus greatly enlarged with flaccid walls, and thin as wash-leather. All hæmorrhage had ceased, but the woman was suffering from profound shock and died an hour after the extraction.

Again in 1907 I performed a Cæsarean section before the onset of labour on a woman whom I considered healthy. I quote from the Rotunda Report. "The uterus, on being opened, displayed an almost bloodless condition, and the placenta was so firmly adherent that its removal was accomplished with the greatest difficulty.

"During this manipulation the atonic uterus lay flabby and thin-walled without showing the slightest indication of retracting and thickening. Hæmorrhage was very slight, and we proceeded to stitch the uterus without the least foreboding of disaster. Suddenly the anæsthetist announced that respiration had ceased, and the operation had at once to be interrupted whilst successful means were adopted to revive the patient. The pulse, however, remained quite imperceptible, and was never felt again. though death did not take place until three hours after the completion of the operation.


"It may be remembered that in 1905-6 I commented on three labour deaths due, in my opinion, to obstetrical shock apart from severe hæmorrhage. In these cases the uterus was found flabby and dilated. This condition is frequently the accompaniment of adherent placenta, and the dilated condition of the uterus precedes rather than follows the general shock. We consider this case one of the same class."

Here, then, is the record of a condition written fourteen years ago and whilst the tragedy was fresh in my memory. I could only record, not explain.

Another well-known observation may be cited. A uterus which has retracted after child-birth again fills with blood and does so until its fundus once more reaches the ensiform cartilage, contractions then occur which expel the contents, or the blood is expressed by the examiner's hand. A sudden outpouring occurs, followed by immediate and severe shock, symptoms which follow rather than precede the uterine

enlargement. This enlargement has occurred, not as the result of internal pressure, as is proved by the ease with which expulsion takes place. Further, it is not loss of blood which has caused the shock, for the blood has left the vessels before shock intervenes. Clearly both enlargement of the uterus and shock are due to absorption of poison products.

In considering the mechanism of muscle elongation a new physiological truth becomes evident, for here we have fibres lengthening beyond their normal limit without the intervention of any pulling or pushing force, and there can be no air pressure in the opened uterus of a Cæsarean section. Again, it is a common experience to see the anus dilate before direct pressure is exercised upon it by the presenting foetal head.

 Morley Roberts, and other writers have insisted on the power of a muscle to relax to its normal limit by its own positive force, but I know of no previous observations which suggest the possibility of a muscle in similar manner actually exceeding in length its normal limits or, in other words, undergoing a process the reverse of retraction.

The powers to contract and retract are known properties of muscle, the former a temporary shortening of its fibres is under the control of nerve impulse, the latter is an inherent property uninfluenced by nerve stimulus. It limits the normal range within which a fibre moves, and certainly, as regards the uterus, the muscle will tear rather than stretch if subjected to overwhelming strain.

Again, retraction is quite independent of contraction, and usually takes place when the muscle appears soft and inert. Were this not so a woman would die of hæmorrhage were Cæsarean section performed before labour had started, for then the uterus is always inert. She does not bleed because the uterus retracts and can be seen doing so during the progress of the operation.

We must believe that a reversed process takes place in the growth of a pregnant uterus, one not due to pressure from within, for the walls, save when contracting, are not in tension.

If then slow reversed action is admitted, there is no

inherent difficulty in believing in an accelerated movement rapid as retraction itself.

Let it also be noticed that contractions are not interfered with by this over-stretching, therefore the arteries contracted in shock are probably in a condition of "retraction reversed."

Much that was formerly obscure is made clear by this concept, and we need no longer hold or teach the very improbable view that concealed accidental hæmorrhage arises as the result of an atonic and enfeebled uterus, such a uterus could never mature a full term fœtus, for sterility, abortion or rupture would occur as its inevitable result.

Accidental hæmorrhage is due to either toxæmia or direct violence, and the fact that only 30% of such cases show albuminuria does not militate against the strength of this view, for many toxic conditions are unaccompanied by albumin.

If the blood fails to escape quickly, absorption of its poisonous products is followed by shock and dilatation of the uterus, while the plug, by holding back blood, may increase the severity of the symptoms.

We also see the reason why the operation of Cæsarean section, as practised by Sir William Smyly and myself, is preferable to that of hysterectomy, for the shock is less and the dreaded hæmorrhage is a proved myth.

Hysterectomy with its 50% mortality is based on the supposition of a rotten unretracting uterus.

Again the usual classification of post-partum hæmorrhages is misleading. Years ago I wrote that atonic hæmorrhage was the rarest of rare calamities, for when it was supposed to occur we almost invariably found some mechanical obstruction which prevented the uterus retracting. I now know that it does not exist, for inertia is no bar to retraction. In the rare instances in which I thought I observed it we were really dealing with the "reversed retraction" of shock.

What then becomes of the teaching which condemns forceps as a means of delivery in the presence of uterine inertia? Much unnecessary suffering and harm have resulted as a consequence. It is shock and not inertia that is to be dreaded. Every uterus is inert when Cæsarean

section is performed before labour starts, yet bleeding is not profuse and the muscle can be seen thickening up in spite of its apparent flabbiness.

The views here expressed, if true, should be accepted, and if accepted, must effect great changes in our thought and practice. This will upset many cherished beliefs and render obsolete our newest text-books.

I trust, therefore, that the subject will receive careful consideration. Further facts and logical deductions are most desirable either in proof or disproof of what I have written, but unsupported expressions of opinion or prejudice, such as “I think,” “I hold,” “I believe,” “I feel confident,” are not helpful in the elucidation of this nor of any other scientific problem.

NOTES ON THREE CASES OF PERITONITIS TREATED BY RADIUM.*

· BY WALTER C. STEVENSON.

IN the energy liberated as beta and gamma rays by the disruption of the elements radium B and radium C and of some other radio-active elements, we have the most powerful physical agent known to science for affecting the metabolism of cells. If in any number, these rays must and do affect, in some way, every cell they encounter. As the hard gamma rays of radium will readily pass through 6 ft. of animal tissue—every cell in the human body can be irradiated.

The effect of radiations depends upon the dose and the nature of the cell irradiated. Small doses stimulate cell metabolism, larger doses retard metabolism, and larger doses still cause death of the cell. It is because some cells are more vulnerable to radiations than others that radium treatment has proved so valuable in cancer. Here large doses are given to cause disintegration of the less stable malignant cells—while in an ideal dose the normal cells may even be stimulated to replace the malignant cells, has been shown microscopically by Morson. Looked at from another point of view cancer is cured by irradiation when the resisting power of normal cells is so increased that cancer cells, devitalised by radiations, can no longer survive.

As irradiation can increase the resistance of normal tissue to cancer cells to such an extent as to bring about a cure in favourable and localised cases, where every cancer cell can be treated, it is not unlikely that radium treatment will profoundly influence other pathological conditions, such as tuberculosis, where there is a continued and often prolonged struggle for mastery between the infection and the body resistance.

If radiations can stimulate the resistance of the body to

*Read before the Section of Medicine, Royal Academy of Medicine in Ireland, December 9, 1921.

tubercle or lessen the vitality of the infection, they must surely have a beneficial effect on the patient, hasten convalescence or ensure a cure.

Within the last year I have had the opportunity of treating two cases of tuberculous peritonitis—thanks to the kindness of my colleague, Dr. Richard Hayes, at Dr. Steevens' Hospital.

CASE I.—The patient, aged 12, was sent into hospital by Dr. Leeper from the gate lodge, St. Edmondsbury's Asylum, in a critical condition. The child looked extremely ill—pulse 108 on admission, temperature 97° —abdomen swollen and tender, especially in the neighbourhood of McBirney's point—and it was a question if the condition was an appendicitis requiring immediate operation. Dr. Hayes diagnosed tuberculous peritonitis and asked me to see the patient in consultation. We decided not to operate at once. The peritonitis was of the plastic variety without excessive fluid. The abdomen felt doughy, and there were two flat firm plaques which could be felt deep to the abdominal muscles—one mostly above and to the right of the umbilicus, and the second below and to the left. The patient was treated in bed on general lines, cod liver oil on lint being applied to the abdomen. We discussed further treatment, and at Dr. Hayes' suggestion I was glad to try the effect of radium treatment, as I felt confident it would in all probability turn the scales in the patient's favour. Radium was applied on the 20th January last, as I had the honour of reporting to this Section of the Academy in a paper read on that date. From that time the patient has never looked back, except for an attack of influenza in April, 1921. A fortnight after the first treatment the abdomen felt less doughy: a fortnight later the plaques which felt almost calcareous were more distinctly defined, but covered a smaller area as if the surrounding infiltration had been absorbed. Three weeks ago, when last seen, there was still some thickening round the umbilicus, which was comparatively difficult to feel. The patient looked quite robust, had grown tremendously and become fat.

This patient's abdomen was irradiated on the 20th January, 7th February, and 28th April. She was discharged

on the 15th May—and re-admitted for a day on the 13th July for 25 hours' treatment.

CASE II.—The second case I have to record is a boy of 17 years, also a patient of Dr. Hayes' in Steevens' Hospital, who was admitted last May. He did not look quite so ill as the child, but his abdomen was as swollen and doughy, and rather more tender than in the other case. He had constant pain in the abdomen. He walked in a very circumspect manner, as any movement caused him pain, which a jolt in walking increased. He had also a tuberculous elbow, which I aspirated and put at rest in plaster. In view of the first case we had no hesitation in deciding the line of treatment to be adopted—and I applied radium to his abdomen on May 25. His abdominal pain and tenderness were much less in a week; and had disappeared in a fortnight. The abdomen in this case was more uniformly infiltrated, and there were no calcareous deposits apparent as in the first case. When the general infiltration had disappeared with treatment, a thickening was discernible in the left lower abdominal wall and a mass of glands in the right iliac fossa. Later, instead of an inflamed mass of glands, two discrete and comparatively small glands could be felt, loosely connected to the iliac fossa. He was discharged from Hospital after 12 weeks—on the 13th August last, and went to the country in very fair health. He returned to see us on 24th October to have the plaster removed, as it prevented him using his hand; he had become fat and looked the picture of health. His abdomen was normal except for a slight thickening on the left side and the remains of the glands on the right. He had no abdominal symptoms. There was still some swelling of the elbow, but when the plaster was removed movements were fairly free and caused no pain. His abdomen and elbow were again irradiated and plaster applied to the arm, not this time including the hand. Dr. Hayes heard from him this week that he was using his hand freely. Apparently his abdominal trouble is a thing of the past, as he did not mention it. This patient's abdomen was irradiated on the 25th May, 4th June, the 6th August, and 28th October. On each occasion the elbow was also treated by radium.

These two cases represent a type that frequently recover with ordinary recognised methods of treatment, and I wish rather to emphasise than to detract from the importance of rest, good food, and hospital nursing. But I do wish especially to emphasise the importance of the powerful local treatment, which acted not on the skin alone, like a blister, but like a blister that affected directly every individual cell whether diseased or otherwise in the area of the body treated, quite independently of the action of the circulatory, alimentary or nervous systems. I am quite convinced in my own mind, and I believe that I am right in saying that my colleagues who have seen these cases in Steevens' Hospital agree with me, that neither of them would have made as rapid or as complete a recovery but for the radium treatment.

CASE III.—The third case I should like to bring to your notice is in quite a different category: she is a Dublin hospital nurse, aged 37 years, whom I believe would be in her grave a month ago but for radium. On going round Steevens' Hospital after my summer holidays I received a message that Dr. Crofton had asked me to treat an abdominal case with radium. It was thought to be a case of tubercular peritonitis with ascites. It turned out that an exploratory laparotomy had been performed in October, 1920, by Dr. Bethel Solomons, for ascites and pelvic tumour, which proved to be malignant and inoperable. I am indebted to Dr. Solomons for the following report on this case: "At the laparotomy on Miss O. free fluid was found in the abdomen with cancer disseminated all over the place. A gland was removed and reported by the pathologist to be a colloid cancer." When I saw the patient she was in great abdominal pain and discomfort and she complained of constant vomiting. The patient looked very ill, and I did not like to subject her to much examination, as she was not fit for it. I found out that she had been frequently tapped, and that 16 pints and $18\frac{1}{2}$ pints had been taken from her abdomen in Steevens' on the 6th of September and the 6th October, respectively. The patient was so bad that I hesitated to treat her at all, as she looked as if she could not last a week in her then condition. As I knew from experience that irradiation frequently relieves pain and tenderness and has a

sedative effect on abdominal discomfort, I was tempted to try and relieve her symptoms. She was anxious to get home to the country at once, as she was going rapidly down hill. I had to make up my mind as to what kind of dose to give her, and finally decided to give her an enormous dose, I am afraid on the "desperate remedy" lines. Starting at 7.45 a.m. on the 10th October last, I irradiated her for 94 hours, *i.e.*, 4 days over 25 areas and used up 61.7 millicuries, a dose of 8296.25 millicurie-hours. Two days after treatment had finished she was slightly more comfortable, and managed to leave Hospital alive 3 days later, on the 19th October. Three weeks later she wrote a most cheerful letter to my colleague, Dr. Kirkpatrick, saying she was much better and that vomiting had completely ceased. I wrote to her, really to confirm her statements, and advised her to return for more treatment if she was able. She writes from Limerick on 29th November last:—"Next week I expect to be with a friend at Cork—vomiting has ceased since I left Hospital. My health is normal, *i.e.*, temperature, pulse, respirations. Kidneys acting well—instead of five it is now 45 ozs. in 24 hours. My weight has gone up 2 stone. Feeling hungry at all times—hence an enormous appetite. I shall call on you at the said time. I am anxious to get well if possible as I want to get to sunny Africa—an old billet is waiting for me." I hope she will get well, but it is difficult to cure disseminated cancer.

Method of Treatment.

Radium treatment in these three cases was administered by the surface application of emanation capillaries supplied by the Royal Dublin Society Radium Institute. Capillaries are placed parallel to one another in a box of 2 x 3 cm. internal surface area. The box is of lead 2 mm. thick, or a brass one 3 mm. thick.

Technique of Treatment.

The actual treatment is carried out by the Nursing Staff of the Hospital in strict accordance with the instructions written out on the radium chart, which I fill up myself. The part to be treated, in this case the abdomen, is marked

out with ink or an aniline pencil into areas about 4 x 6 cm., which are numbered. Corresponding numbers and areas are marked in a rough sketch of the part in radium chart, and explicit written directions are given stating the number of hours for which each area is to be treated, and the time the radium is to be applied, and to be removed from each area. The nurse on duty—day or night—is required to record each move of the radium as she does it, and to sign the entry to ensure accuracy and responsibility.

Calculation of Dose.

I calculate my dose by the amount of radiation which will cause erythema of the skin when radium is applied in the standard box. I have found by experience that this is about 400 millicurie-hours or when 3 millicuries of radium emanation have dissipated. By consulting the radium emanation table it is easy to see how long it will take for 3 millicuries to disappear. The table shows that for 100 millicuries it will take 4 hours—for 60 millicuries $6\frac{1}{2}$ hours—or roughly by dividing 400 by the number of millicuries in use it would give the number of hours for which it is to be applied.

Recording of Dose.

I invariably record the dose in the form of an equation. For instance, in the first case the treatment given on the 20th January, 1921, is recorded as :—(1) $47.5 - 38.0 = 9.5$ (10) $30 = 1282.5$ mch. (millicurie-hours). This conveys to me at once that when I started treatment the activity of the emanation was 47.5 millicuries and when the treatment was finished its activity was reduced to 38.0 ; also that 9.5 millicuries were used up on this occasion, that 10 areas were treated, and that the treatment went on for 30 hours. The average amount of emanation used in this case 42.75×30 hours gives the millicurie-hours, 1282.5. These figures would enable me to repeat faithfully the dose in every detail, should I require to do so.

I can also see from them the proportion of an erythema dose that is administered to each area. For instance, by dividing 9.5 by 10 I get about 1 millicurie used up in one area, which is a third of 3 millicuries, the erythema dose.

Rationale of Dose.

In the case of cancer one wishes to give as big a dose as possible, but one does not want to produce a permanent damage to the skin, so that the dose is limited by the amount of radiation which will cause erythema, which for one treatment is the full dose for one particular area.

In tuberculous cases, on the other hand, I do not think it advisable to give as big a dose as possible, because I want to get a stimulating effect on the normal cells rather than a devitalising effect on pathological cells. I also think that on the whole it is better to use a small amount of emanation and leave it on for a considerable time, *i.e.*, to give a long and gentle stimulus rather than a massive dose to produce a sharp reaction. It will be seen from the figures below that I used in Case I. on 7th February, 5.6 millicuries to start with, and the radium emanation was applied continuously for 12 days for 24 hours on each of 12 areas. In this particular series of exposures I did not aim at the same amount of radiation through each skin area as long as the skin was safe from injury. On the first area .93 millicuries were expended = 123.4 millicurie-hours, on the twelfth area .106 millicuries = 14.256 millicurie-hours.

Details of Radiation Doses.

The doses administered in these cases, recorded in the manner indicated above, are as follows:—

CASE I.

Abdomen.

- (1) 20th Jan., '21. $47.5 - 38.0 = 9.5$ (10) 30 = 1282.5 mch.
- (2) 7th Feb., '21. $5.610 - .647 = 4.963$ (12) 288 = 604.5 mch.
- (3) 28th Apr., '21. $61.4 - 51.3 = 10.1$ (12) 24 = 1352.4 mch.
- (4) 13th July, '21. $86.7 - 71.9 = 14.2$ (7) 25 = 1990.0 mch.

Totals :—38.763 millicuries dissipated during treatment. 41 areas treated. 367 hours (15 days 7 hours) occupied by treatment. 5229.4 millicurie-hours.

CASE II.

Abdomen.

- (1) 25th May, '21. $72.9 - 54.5 = 18.4$ (13) 39 = 2484.3 mch.

(2) 4th June, '21. $33.9 - 20.3 = 13.6$ (14) 48 = 1642.8 mch.

(3) 6th Aug., '21. $82.9 - 78.1 = 4.8$ (4) 8 = 644.0 mch.

12th Aug., '21. $33.6 - 28.5 = 5.1$ (7) 22 = 682.1 mch.

(4) 28th Oct., '21. $55.3 - 43.5 = 11.8$ (7) 20 = 1028.0 mch.

Totals :—49.7 millicuries used, 45 areas, 157 hours (6 days 13 hours) 6481.2 millicurie-hours.

Elbow.

(1) 28th May, '21. $44.9 - 37.2 = 7.7$ (5) 25 = 1026.0 mch.

(2) 10th Aug., '21. Radium element .98 mgs. .464 (5) 58 = 56.84 mch.

(3) 24th Oct., '21. $9.85 - 5.25 = 4.6$ (7784) = 634.2 mch.

Totals :—12.764 millicuries used, 17 areas, 177 hours (7 days 9 hours), 1727.04 millicurie-hours.

CASE III.

Abdomen.

10th Oct., '21. $86.7 - 78.7 = 8.0$ ($2\frac{1}{2}$) 13 = 1075.1 mch.

$116.0 - 62.3 = 53.7$ ($22\frac{1}{2}$) 81 = 7221.15 mch.

Totals :—61.7 millicuries used, 25 areas, 94 hours (3 days 22 hours), 8296.25 millicurie-hours.

From these details of the dosage it will be seen at once that the cancer patient received a considerable larger dose in one treatment, lasting four days, than the tuberculous patients did in four treatments, spread over six months.



ZINC IONISATION AND ZINC ELECTROLYSIS IN DISEASES OF THE THROAT, NOSE AND EAR.

BY A. R. FRIEL, LONDON.

BY electrolysis in medical work we usually mean the changes which take place when a needle attached to one of the terminals of an electric battery is inserted in the tissues ; and by ionisation, the introduction into the tissues of one or other of the radicles of a salt dissolved in water.

Zinc ions, whether derived from a zinc needle or from a solution of zinc salt, coagulate albumen. Consequently cells—tissue cells, blood cells, or bacteria—when penetrated by the zinc ions are coagulated, and therefore killed. Owing to the force in the electric current the zinc ions can be made to penetrate exudation covering a mucous surface, or granulation tissue, and for that matter the tissues themselves to any required depth.

Among the diseases in which zinc ionisation is of special benefit are chronic otorrhœa, and chronic empyema of the maxillary sinus, frontal sinus, or sphenoidal sinus. The destruction of aural polypi or granulations by zinc electrolysis is an illustration of the use of this procedure. If a microscopic examination is made of the discharge from a case of acute suppurative otitis media, and compared with one made from a case of chronic suppurative otitis media, it will be seen that in the acute case the leucocytes are well stained, and micro-organisms of one variety only are present, whereas, in the chronic case many of the leucocytes are badly stained and broken up, and micro-organisms of several varieties are present in large numbers.

When a patient gets an attack of acute otitis media the tissues are attacked by one variety of micro-organism ; the tissues react and in a few days develop sufficient immunity to repel the bacteria. Then one of two things happens : either the bacteria are killed and the discharge ceases, or, before this occurs the discharge is invaded by micro-organisms from the skin of the meatus, etc., and these micro-organisms and their products, and the decomposition products of the serum and leucocytes irritate the tissues with which they are in contact, and these latter respond by secreting more leucocytes and more serum.

This extra infection of the discharge is the basic factor in chronic otorrhœa, although other factors may be super-added later, by extension of the disease to adjacent parts, or by the development of polypi and caries. In stating this one is only applying Sir Almroth Wright's work on wounds to a special case of sepsis.

In chronic otorrhœa there is an infection of an albuminous fluid, outside the tissues but in contact with them, and the wall of the cavity in which the fluid lies is of living tissue.

In the acute case the attack is directly on the tissues : in the chronic case the attack is on the discharge, and there is, to borrow an analogy from "by-products" in chemistry, what may be called a "by-irritation" of the tissues.

By means of syringing and "free drainage" we can remove microscopic accumulations of discharge and avoid their reaccumulation, but we cannot deal effectively with the microscopic layer of serum and bacteria adhering to the surface. Experience shows that antiseptic drops and lotions frequently do not give rapid results. It is here that zinc ionisation is so effective. The criteria that might be suggested as tests of this statement are :—

1. The results should be immediate.
2. The results should be unequivocal, *i.e.*, in this case complete cessation of discharge.
3. The results should be consistent.

Before citing cases it is well to be precise as to the conditions which must be fulfilled in order that these results may be attained. Years ago Prof. Leduc laid down that zinc ionisation was an effective antiseptic procedure if the fluid containing the zinc salt was applied to the *whole* of the infected area, and the electric current was distributed in sufficient amount. If a mechanical obstacle exists, such as when the perforation in the drum is so minute that we cannot fill the middle ear with the zinc solution, or the septic material is in a place that is inaccessible without operation, such as the mastoid antrum, we need not attempt to apply this form of treatment.

The conditions existing in chronic otorrhœa may be tabulated thus :—

1. Tympanic conditions.
 - (a) *Tympanic sepsis.*
 - (b) Tympanic sepsis and granulations.
 - (c) Tympanic sepsis and polypi.
 - (d) Tympanic sepsis and caries.
2. Tympanic conditions + eustachian infection, septic tonsils or septic adenoids, rhinitis, septic teeth, sinusitis.
3. Tympanic conditions + inflammation of the external auditory meatus.
4. Tympanic conditions + mastoid or attic disease.

Cases of tubercular disease are excluded from the present discussion as in that disease the bacteria are situated in the tissues.

In cases in which the otorrhœa is due only to tympanic sepsis the result of treatment by zinc ionisation are immediate, complete and consistent. Some cases are quoted as examples.

Age of Patient	Ear	Patient states duration of discharge	Diagnosed cause of chronicity	Treatment
21	L.	8 years	Tympanic Sepsis	May 13. Zn. Ion. 3 ma. 15 min. May 17. No discharge
17	R.	11 days	do.	May 20. Zn. Ion. 3 ma. 10 min. May 27. No discharge.
29	R.	? years	do.	May 4. Zn. Ion. 3 ma. 10 min. May 18. No discharge.
7	R.	10 days	do.	April 5. Zn. Ion. 3 ma. 10 min. April 12. No discharge.
31	R.	2 months	do.	June 24. Zn. Ion. 3 ma. 10 min. July 1. No discharge.
29	L.	3 weeks	do.	October 18. Zn. Ion. 2 ma. 15 min. October 28. No discharge.

It will be asked : " Is anything in addition to zinc ionisation necessary or desirable ? " The answer is : " In cases in which tympanic sepsis alone is present, nothing whatever." Where small granulations exist, or where the mucous membrane is much swollen, or when the patient does hard manual work which would favour slight exudation, it is advisable to blow into the meatus after ionisation (but without drying the ear) some boracic powder to absorb and keep sterile any

serous exudation which might take place during the next two or three days.

When the patient returns in a week the discharge may have entirely ceased or only a very small quantity be present. If there is some it is removed with a swab and boracic powder is blown in. When he returns the following week the ear will probably be dry and require no treatment.

When the granulations are large and polypoid it is advisable before ionisation to insert into them two zinc needles and destroy them by electrolysis. Where a large polypus is present as much as possible should be removed by a snare, and what is left destroyed by zinc electrolysis. A polypus of a moderate size can readily be destroyed by this method alone.

Where much enlarged tonsils and adenoids are present these should be treated to guard against relapse, but in my experience they do not prevent the cure of otorrhœa by ionisation.

It is different where there is nasal and post-nasal infection with large numbers of bacteria in the nasal secretion. Ionisation of the ear in such a case is not likely to be a success unless this factor is first dealt with.

Cases of mastoid and attic disease are not usually suitable for treatment by ionisation alone.

Where the external auditory canal is inflamed and excoriated as a result of middle ear discharge it is advisable to blow in boracic powder after ionisation.

It is not always possible when an ear is presented for examination to say at the first visit what are the conditions present, but it is very much easier to do so after one ionisation. There is then, in those cases in which the discharge has not ceased, a great improvement in the ear, and it may be, for example, easy to discover a polypus which owing to the general swelling was indistinguishable from the rest of the cavity; or it may be possible to aspirate pus from the aditus, or some recess, where, owing to the swelling of the mucous membrane obstruction to its exit occurred when additional congestion was caused by the aspiration. During several years past the aid which ionisation affords in diagnosis has been frequently impressed upon me.

At a recent meeting of the Otological Section of the Royal Society of Medicine I submitted the results of all cases treated by ionisation over a period of some months, and showed in those which were successful the total amount of treatment which each patient had received, and in those which were not successful the ascertained reason for the continuance of the discharge, *e.g.*, mastoid disease, polypus, cholesteatoma, etc. A synopsis follows. These cases were treated in the Aural Department of the Royal Free Hospital, where Mr. Gay French gave me ample facilities, at a Clinic for Pensioners under Sir James Dundas Grant, and at a Clinic for School Children in Stepney.

Number of ears ionised	...	...	...	217
1. Number in which the result is known	...	...	...	157
A. Discharge ceased	...	...	...	111
(a) Due to ionisation	...	...	...	104
(b) Possibly not mainly due	...	...	...	7
B. Discharge not ceased	...	...	...	46
Owing to :—				
(a) Conditions resulting from former				
mastoid operation	...	...	...	6
(b) Polypi or granulation	...	...	...	13
(c) Cholesteatoma or Epidermal over-				
growth	...	...	...	2
(d) Mastoid or Attic disease	...	...	...	15
(e) Eustachian obstruction	...	...	...	2
(f) Tonsils and adenoids	...	...	...	2
(g) Too small a perforation	...	...	...	1
(h) Unascertained causes	...	...	...	4
2. Number in which the result is not known	...	...	...	60
A. Did not return	...	...	...	24
B. Treatment not completed or observation				
not sufficiently prolonged	...	...	...	36

What proportion of cases of otorrhœa may be expected to be readily curable by ionisation ?

At a Clinic of the London County Council for the Treatment of Otorrhœa in School Children by Ionisation all the cases of otorrhœa attending a minor ailment treatment centre were examined, and the results are shown in the following table.

ANALYSIS OF OTORRHŒA CASES AT THE ALMERIC PAGET
MINOR AILMENT TREATMENT CENTRE.

IONISED Cases 38	Cured	Did not Return	Ceased to Attend	Referred for Operation	Still under Treatment
Cause of Chronicity of discharge ...					
1. Tympanic Conditions					
1. Tympanic Sepsis	16	1	1	—	—
2. Tympanic Sepsis + Granulations ...	5	2	2	—	—
3. Tympanic Sepsis + Polypi ...	1	—	—	—	—
2. Tympanic Conditions + Eustachian In- fection, Tonsils, Ade- noidis, or Rhinitis ...	3	—	1	—	—
3. Tympanic Conditions + Inflammation of the External Audi- tory Meatus ...	—	—	—	—	—
4. Tympanic Conditions + Mastoid Infection	1	—	—	2	1
5. Cause not diagnosed	1	—	1	—	—
TOTAL 38 ...	27	3	5	2	1
NON-IONISED Cases 34					
Treated at Clinic by syringing and drops alone, 21 ...	21	—	—	—	—
„ + Referred for operation 8 ...	—	—	—	8	—
„ + Removal of Polypi, 2 ...	1	—	—	—	1
„ + Other treat- ment, 3 ...	—	—	—	—	3
TOTAL 34 ...	22	—	—	8	4
TOTAL 72 ...	49	3	5	10	5

To answer the question with accuracy a much larger number of cases would have to be examined and treated, but from personal experience I can say the proportion is large. Twenty-one of the children who had been treated at the General Clinic by syringing and drops alone were well when examined by me. It may be concluded that these would have speedily recovered with ionisation.

An analysis of 49 cases cured by ionisation shows that

- 43 had 1 ionisation.
- 1 had 2 ionisations.
- 4 had 3 ionisations.
- 3 had 4 ionisations.

Of these cases

- 27 paid 2 visits to the clinic.
- 11 paid 3 visits.
- 11 paid over 3 visits.

Of 18 cases which had been cured by syringing and drops it was calculated that the average number of visits was 50.

- 10 patients had under 20 visits.
- 8 patients had over 20 visits.

The average number of visits of those cured by ionisation was 3.5.

Another question will be asked: "Is the result permanent?" Zinc ionisation is an antiseptic procedure. It is not a method for producing immunity. Immunity in these cases is a condition acquired as a result of infection or inoculation, and presumably the tissues in the ear have been inoculated to a considerable extent by the products of the germs which have been so long in contact with them. As a matter of experience, when a patient has recovered from the otorrhœa by ionisation a recurrence is uncommon unless the patient gets a fresh infection by bathing or by a severe cold or influenza. In acute otitis media which does not clear up rapidly treatment by a vaccine is rational and sometimes it obviates the necessity for a mastoid operation. To treat a case of chronic otorrhœa by vaccines alone is to court disappointment.

With the limitations previously described, and it is as necessary to bring into prominence the limitations as it is to state the indications, the treatment of otorrhœa by zinc ionisation is consistently successful.

Mutatis mutandis similar treatment is applicable to simple chronic empyema of the maxillary, frontal, or sphenoidal sinus. Special care is necessary in diagnosis to exclude ethmoidal disease. If ethmoidal disease co-exists and does not receive operative treatment prior to ionisation, re-infection of the larger sinuses is certain to occur.

The technique in the case of the nasal sinuses is complicated by the necessity for preventing the zinc solution running into the throat. A small air balloon introduced empty into the posterior choana or postnasal space and then inflated closes this opening, and then one can proceed to fill the sinus.

One of the great advantages of treatment by ionisation is that it is not necessary to alter radically the architecture of an organ to provide free drainage. The necessity for doing so was based on our inability hitherto to sterilise the microscopic layer of exudation and bacteria adhering to the surface of the mucous membrane without at the same time irritating the tissues. The knowledge of the efficacy of zinc ionisation in local septic conditions and the laws governing its application we owe to Prof. Leduc of Nantes, and it is the immediate unequivocal, and consistent results which follow the application of the knowledge and of the laws which convince us of its worth as a method of treatment.

We sympathise with our readers in the delay that has taken place in publication of this issue.

The Journal was in the process of printing when Messrs. Cahill's Works were destroyed by fire. Future issues will be published as usual.

BOOKS.

THIS MONTH'S SPECIAL REVIEWS.

The Surgical Exposure of Deep-Seated Blood Vessels. By J. FIOLE, M.D., and J. DELMAS, M.D., with 34 original illustrations by H. BALFOUR. Translated and edited by C. H. CUMSTONE, M.D. (Geneva). Heinemann, London, 1921.

THIS book is a fascinating study in applied anatomy. In eighty-two short pages, illustrated by thirty-four plates, the authors give to vascular exposures of traditional difficulty a grace of simple execution reflected in a style which can often be guessed from the translation.

They make clear that it is not their purpose to change in any way approved methods such, for example, as that of ligating the lingual artery before excising the tongue. They point out, however, that in limbs distended with blood, where it is impossible to know beforehand what artery or vein is bleeding a much more extensive exposure is needed than that required for simple ligature of a vessel. With such conditions, and also in the surgery of aneurysm, the operator commencing his intervention by the classic route is frequently driven to enlarge the field of operation. To do this he must improvise a mode of access, often in the disquieting presence of hæmorrhage. "Why, therefore, in the case of organs whose lesions may be followed by the most dramatic incidents, does one still obstinately refuse to expose them freely?"

The exposure of the deep-seated vessels of the leg is first described, and a separate chapter is given to Duval's approach to the arch of the anterior tibial artery. The beautiful methods of exposing the posterior tibial, gluteal sciatic and internal pudic, the brachial bifurcation, and the femoro-popliteal trunk are typical of the authors' genius for combining wide approach with negligible damage.

In the neck their *truc* for securing a wide and safe access to the perilous upper reaches of the internal jugular and the carotids is simple and excellent. Exposure of the vascular trunks at the thoracic inlet is fully described.

Many errata unfortunately appear in these few pages. The "white cord representing the internal saphenous vein leaving the canal" of Hunter (p. 38), should read "nerve," and the repetition of the word "cord" in the next sentence to indicate the tendon of the adductor magnus, is misleading. The artery referred to as "epigastric" on page 40, in connection with hæmorrhage in the gluteal region should, of course, be "hypogastric"—the internal iliac of the old terminology. "Internal jugular" (p. 71) should be "external jugular." There is a confusion of French and English measures on page 56; the incision described would extend beyond the limits of the patient. The word "quadrant" as applied to the division of an arterial trunk like the popliteal into its main branches, has no significance in English, and the repetition of the adjective "presolar" gives the soleus muscle an undesigned place in the sun.

These are errors in the letter of the translation, but they detract nothing from the praise due to the translator for catching much of the free spirit of the original.

Sir D'Arcy Power in a preface states the book is not for students nor for daily use. We entirely disagree; such books are a genuine inspiration. We cannot see why students in their growing years should be condemned to the mere dry bread of text-book surgery, and be deprived of sweetness and light.

A. K. H.

The Dublin University Calendar for the Year 1921-1922.

Dublin: Hodges, Figgis & Co. 1921. 8vo pp.

Pp. x + 60* + 513.

THIS volume, indispensable to all who are connected with the ancient and famous foundation of Queen Elizabeth, is published on the usual lines.

The Regulations affecting the School of Physic in Ireland occupy 45 pages (252 to 296) inclusive. Further, a list of students in Medicine not on the Books in Arts on July 1, 1921, is given at pages 492 and 493.

As to the present numerical strength of Trinity College, we are glad to find that the total number of students on the the College books under the Degree of Master of Arts has

now reached the substantial figure of 1303, including the names of 245 women. Of these, 27 are Non-Foundation Scholars ; 212 are Pensioners, and 6 are Sizars and Ex-Sizars. The men students number 1,058, and include 61 Scholars of the House, 950 Pensioners, and 47 Sizars and Ex-Sizars. The foregoing numbers show a satisfactory and material advance on last year's figures, which totalled 1,268.

The members of the *Senatus Academicus* number 294, compared with 307 in 1920-1921. To the list of University Electors only 95 names have been added as against 178 in the previous year. This falling-off is apparently due to the fact that no General Election has recently taken place.

The Undergraduate Ordinary Examination papers set in the year 1920-1921 are given in an Appendix which runs to 116 pages.

Autobiography of Sir Charles A. Cameron. With an Introduction by the RIGHT HON. SIR JAMES H. M. CAMPBELL, Bart., P.C., Lord High Chancellor of Ireland. Illustrated. Dublin : Hodges, Figgis & Co., 20 Nassau Street. Belfast : Mullan & Son. London : Simpkin, Marshall, Hamilton, Kent & Co., Ltd.

THE autobiography of a life extending over 90 years, of a man familiar with all classes of society cannot be other than interesting, and the book before us possesses this qualification. Its value is further enhanced by the gift Sir Charles Cameron had of being a good relator of both what he heard and saw. He seems to have kept a diary and that from his schooldays, so that nothing escaped notice. Of course his intimate connection with the Masonic Order made him hosts of friends and provides many pleasant reminiscences. As Officer of Health his acquaintance with Castle officials and successive Viceroys provided him with officialdom gossip ; still more interesting is the story of his connection with the Dublin Corporation, which lasted until the end of his life.

To all who find pleasure in reading of old Dublin and how gradually its social life changed, we recommend the book as giving in a chatty, conversational way an excellent and pleasing picture of the life in the nineteenth century.

Henry Quin, M.D., President and Fellow of the King and Queen's College of Physicians in Ireland, and King's Professor of the Practice of Physic (1718-1791). By T. PERCY C. KIRKPATRICK, M.D., M.R.I.A., Fellow and Registrar of the Royal College of Physicians of Ireland. Dublin: Printed at the University Press, by Ponsonby & Gibbs. 1919.

THIS interesting biographical sketch of Dr. Quin is very appropriately dedicated to Dr. Alexander Morison, M.D., in gratitude for his gift of the bust of Dr. Henry Quin to the Royal College of Physicians of Ireland.

We congratulate Dr. Kirkpatrick on his writing and on the manner of its publication, which is worthy of the letter-press and prejudices the reader in favour of the volume. Very seldom indeed has a writer been called on to re-clothe such dry bones and endow them with a living spirit; yet this was the author's task and he succeeded.

Henry Quin, a sagacious, learned, accomplished, fashionable and successful physician, of the eighteenth century, accumulated an immense fortune; married into a noble family; was given to hospitality; was a musician; and in accordance with the custom of the age became a patron of art and promoted the advancement of two gifted men. But Quin contributed nothing to medicine, not even a rush light; withal his biography is a valuable addition to medicine, for this fashionable physician played an important part in the medical world of his day; and was a zealous contributor to the formulation of such rules as promoted the development of modern medical teaching. And, further, the volume exhibits the social life of a fashionable physician of the past. We must, however, acknowledge that many of the interesting side-lights on the professional and social life of the period are from the rich store of things new and old in the author's treasury. Withal we are not quite satisfied with the eulogy of the subject of the memoir. His father must have accumulated a large fortune to allow of his son going to Italy; and no doubt taught his son Henry how to tactfully manage the eccentricities of patients, and, further, he must have seen how inadequately the sick poor were provided. It is common knowledge that the different parish churches of that day had

each a dispensary and paid a physician to attend the poor. And with all this we find no evidence of Henry Quin opening his purse for the necessitous ; even when preparing for death, with the, for that day, prodigious accumulation of £70,000, he gives no thought to necessitous brethren of his own profession, or to the poor generally. We may just add that the search for the genealogical tree of the Quins might well be deleted, as also the senseless table talk and uninteresting journeying of Henry George Quin ; unless it is designed to show how utterly devoid he was of the sagacity, which was his father's chief characteristic.

Theory and Practice of Nursing. By M. A. GULLAN, Sister Tutor of St. Thomas's Hospital. H. K. Lewis & Co. Lond. 1920. Pp. xv. + 214.

THIS is a useful little book, containing much practical information, which should be helpful to a young nurse. Methods, and nursing technique, are set forth in minute detail, and with an explicit force that could only come from a skilful nurse and a practised teacher.

We heartily agree that the training of nurses in the past, and particularly during the years of war, has been slipshod and totally inadequate. Miss Gullan aims at a higher and altogether more scientific standard—no nurse could read her book with understanding who was not already passably educated and intelligent. Such persons only should enter and succeed in her profession, and it is for such that Miss Gullan works and writes. We question if this ideal is not carried sometimes to extremes in too frequent use of difficult scientific terms (need a nurse learn of the bundle of His), but the error, if such it may be called, is an error on the right side. The distinction, too, is not always clearly drawn between treatment employed by the medical man and that devolving on the nurse. This might be a source of danger in officious, untrained hands—were not the book written “to supplement ward instruction.” Such instruction, no doubt, would make all these points clear.

The book is plentifully interleaved for note-taking and contains an unusual wealth of practical feminine detail.

Surgical Nursing and The Principles of Surgery for Nurses.

By RUSSELL HOWARD, C.B.E., F.R.S. 4th Edit.

Edward Arnold. London. 1920. Pp. xvi + 320.

THE appearance of this small work in its fourth edition is its own eulogy. It has been revised, and somewhat enlarged, but its general scope and arrangement remains the same as in previous editions, and is much to be commended. It touches briefly on most points of importance in surgical nursing. The chapter on operations, with preparation, and after treatment is particularly valuable. The whole book is rich in practical detail, written clearly in simple language, and should be a standard text-book for any nurse during her surgical training. It is well and clearly illustrated with photographs and diagrams.

The Care of Eye Cases. By R. H. ELLIOTT. Oxford Medical

Publications. Henry Frowde and Hodder & Stoughton.

London. Pp. xii + 127. 12s. 6d.

THIS book is divided into three parts. In the first the author gives a brief sketch of the anatomy of the eye, of the methods at our disposal for the diagnosis of ocular disorders, and of the more usual remedies for the same. In the second, he deals with the disorders themselves, and in the third, enumerates those instruments most commonly employed in ophthalmic surgery.

In his preface the author states that, while writing the manual he had in his mind the practitioner, the student, and the nurse. It is especially to the last-named that we recommend, and strongly recommend, his book.

We are of the opinion that lectures to probationers are best given by nursing "sisters," and those latter, in charge of "eye" cases will find here an excellent foundation for such.

The merit of the book lies essentially in the simplicity of the explanations, and in the emphasis laid upon the all-important "detail" in the care of eye cases.

The Early Diagnosis of Tubercle. By CLIVE RIVIERE, M.D.,

F.R.C.P. 3rd Edition. 1921. London: Henry Frowde

and Hodder & Stoughton. Pp. xvi + 318. 8vo., 15s.

THE third edition of this work contains few changes or

additions of note. Minor alterations, omissions, and amplifications occur, but the book still retains a large amount of useful information in a small and convenient bulk. The appearance of a third edition so soon indicates the well-deserved popularity of the work.

V. M. S.

Feebleness of Growth and Congenital Dwarfism, with Special Reference to Dysostosis Cleido-Cranialis. By DOCTOR MURK JANSEN, O.B.E., Lecturer on Orthopædic Surgery, University of Leiden, Holland. Oxford Medical Publications. London: Henry Frowde, Oxford University Press; Hodder & Stoughton, Warwick Square, E.C.4. 1921. Pp. xii + 82. 12s. 6d.

WE have read through this book with very great interest. It is divided into two parts, the first of which is entitled "Feebleness of Growth" and is an attempt, as Sir Robert Jones points out in a foreword, to establish definite principles in relation to growth changes and developments, and to show the influence of pathological changes, and those of pressure, upon the determination of deformity. The author himself tells us that, in studying the nature of "Achondroplasia," he came to the conclusion that two principles underlying the facts were:—(1) Injurious agents affecting growing cell-groups enfeeble their power of growth. (2) The measure in which growth is enfeebled is proportional to the rapidity of growth (which he termed "the law of vulnerability of fast-growing cell-groups"). This thesis he attempts to prove, by analysing the symptoms which develop in growing children, under different pathological circumstances, but it is impossible to enter into the details of the argument in a short review. He supports his ideas by the reproduction of numerous excellent illustrations.

Part two deals with "Congenital Dwarfism," and is, for the most part, an attempt to prove that the different varieties of dwarfism, such as "anencephaly," "achondroplasia," "mongolism," etc., are the result of pressure caused by the amnion, at different periods of foetal life. The theory is attractive, but appears to us too mechanical to explain such a condition as mongolism, where mental symptoms predominate; however, to fully appreciate his argument, the

book must be read in full. The entire monograph will probably receive much attention from orthopædic surgeons and all those who are interested in deformities.

The Extra Pharmacopœia. MARTINDALE and WESTCOTT.
Vol. II. Seventeenth Edition. London: H. K. Lewis & Co., Ltd. Pp. 688.

A deservedly popular little book. The title inadequately describes its contents. In it we find the composition of all the proprietary medicines concisely stated—a most useful reference. The impurities present in, the tests for, and the mode of manufacture of B.P. preparations are given in full.

An excellent organic analysis chart is included, and should prove very useful.

Practical articles on ionisation and radiology also appear.

The analytical memoranda are very complete—containing much that is omitted in some of the larger text-books, especially in regard to urine testing.

An extremely good index is included—a very important part of any book to which constant reference is being made.

The book is pocket size, very attractively bound, and should prove of great assistance to its possessor. E. C. S.

Pyorrhœa Alveolaris in its Clinical Aspect. By D. A. CROW, M.B.Ch. Baillière, Tindall & Cox. London. 1921. Pp. xiv + 111.

THERE is a tendency among many dentists to minimise the gravity of pyorrhœa, and on this point they very often come into conflict with the medical profession, who are prone to go to the other extreme and to attribute many and varied diseases to oral sepsis. Mr. Crow in his book inclines towards the latter view, but he to a great extent disarms criticism by advancing many objections to his view and answering these in a convincing manner. There are two or three points which he stresses and with which we entirely agree. First, the importance of radiography as a means of diagnosis. Secondly, that in all true cases of pyorrhœa the radical treatment is the only one; and, thirdly, that proper prophylactic treatment would obviate the disease to a great

extent ; à propos of this point, the Explanatory Pamphlet is one that every dentist might have copied for distribution among his patients.

This is an excellent little book, well turned out and with good illustrations, and we recommend it to both medical and dental practitioners. The fact that it may stimulate a good deal of criticism among the last-mentioned but adds to its value. Not the least interesting part is the foreword by Sir Frank Collier.

Diseases of the Throat, Nose and Ear. By DAN M'KENZIE, M.D., F.R.C.S.E. Published by Wm. Heinemann. London. 1920.

THIS text-book opens with a chapter which deals at some length with note-taking and the general routine examination of the patients attending a Throat, Nose and Ear Department. There are useful observations on symptoms such as voice, hoarseness, cough, respiration, stridor, dyspnœa, deglutition, pain, taste and facies.

An excellent account of the methods of removing the tonsils by the guillotine and by enucleation is given.

The application of diathermy and the use of radium are advocated in the treatment of malignant tumours of the pharynx.

A very complete and exhaustive description of laryngeal tuberculosis, its signs, symptoms, diagnosis and treatment is given. Dr. M'Kenzie, however, is not a strong advocate of galvano-cautery puncture for this condition. Tumours of the larynx are described, and laryngectomy receives full attention, all the modern operations being adequately detailed.

A useful differential diagnosis of central and peripheral laryngeal paralysis is tabulated.

The author does not aspire to anything approaching a complete account of direct bronchoscopy and œsophagoscopy.

Good practical hints are given for the performance of tracheotomy under all conditions.

A very excellent description of the operation of submucous resection of the nasal septum should enable even a beginner to perform the operation.

The practitioner will look in vain for a complete account of the methods of treating the various forms of epistaxis which so commonly confront us in emergencies.

In treating of hay fever and asthma Francis' method of superficial cauterization of the nasal septum and the use of adrenalin are advocated, but no mention of Freeman's work is made, and the association with anaphylaxis is overlooked.

The modern operation of intranasal dacryocystotomy for epiphora and dacryocystitis is described and advocated. In dealing with frontal sinus operations the author favours intranasal drainage. Of external operations the Ogston-Luc method is advised, the Killian operation being merely mentioned to be condemned with scant advocacy.

In the Ear Section the functional and physical examinations are very thoroughly dealt with, the diagnosis and treatment of the various forms of deafness receiving ample description. The indications for and the methods of conducting the mastoid operations are carefully outlined and fully illustrated. The intracranial complications of otogenic origin, such as extradural, cerebral and cerebellar abscess, meningitis, and sinus thrombosis, receive the thoughtful attention they merit, and some helpful suggestions are contributed for their diagnosis and treatment.

Having dealt very superficially with affections of the mouth, salivary glands and palate, the book closes with an account of the cervical glands.

One can recommend the book as a help to the specialist, but chiefly as a guide for the student and general practitioner.

It is well written and breathes an air of the author's individuality and independence of view. The volume is excellently printed by Messrs. Cahill of Dublin, and the illustrations are numerous and splendidly produced and reflect great credit on the publishers. T. O. GRAHAM.

ABSTRACTS OF CURRENT LITERATURE.

D'ARCY POWER : *The Palliative Treatment of Aneurysm, by " Wiring " with Colt's Apparatus.* "British Jour. Surg." Vol. IX. No. 33. 1921.

THIS paper summarises the cases of pathological aneurysm treated by Colt's apparatus (without electrolysis) up to March, 1921.

A trocar and cannula are introduced into the aneurysmal sac ; the trocar is withdrawn, and if a spurt of blood shows that the sac has been tapped a tube containing a folded gilt wire replaces the trocar. The wire is discharged into the cavity by means of a ramrod, and expands like an umbrella. The granular gilding favours the formation of a clot

TABLE I.

1. Male.—Ascending arch ; right carotid and subclavian tied two years previously ; sac bulging externally. Died seven days after operation from external hæmorrhage.—*Unpublished.*
2. Female.—Descending arch. Died four months after operation from rupture of sac.—*Power.*
3. Male.—Ascending and transverse arch. Died eleven days after operation from dyspnœa.—*Power.*
4. Male.—Ascending arch. Died three and a half years after first and two and a quarter years after second operation, probably from rupture of sac.—*Power.*
5. Female.—Ascending arch. Alive and well two years after first and eight months after second operation.—*Power.*
6. Male.—Abdominal. Died two days after operation from ether pneumonia.—*H.*
7. Male.—Abdominal. Died four days after operation from rupture of sac.—*Power.*
8. Male.—Abdominal. Died two months after operation from leakage of sac.—*Unpublished.*
9. Male.—Abdominal. Died of pneumonia some months after operation. No further particulars could be obtained.—*Conway Dwyer.*
10. Male.—Abdominal (partly dissecting). Died six days after operation. The cage had not expanded.—*Braine Hartnell and Collins.*
11. Male.—Abdominal, causing pyloric obstruction ; gastro-enterostomy. Died of rupture of sac seven days after wiring.—*Wheeler.*
12. Male.—Abdominal. Alive and well eleven and a-half years after operation.—*Wheeler.*

13. Male.—Abdominal. Died four years eight months after operation from leakage of secondary dilatation. Aneurysm apparently cured.—*Wheeler*.
14. Male.—Abdominal. Died nine days after operation from rupture of sac.—*Gask*.
15. Male.—Abdominal. Died ten and a-half years after operation. No details ascertained.—*Lawson*.
16. Female.—Abdominal. Died one year after operation, probably from rupture of sac.—*Maunsell*.

In view of the fact that relief from pain is often secured by rest in bed, restriction of fluid, and iodide medication, the following table of cases *not* treated by operation enables an estimate to be formed regarding the value of Colt's operation in prolonging life.

TABLE II.				Number
Site of Aneurysm	Median Age	Median Duration of Symptoms	of Cases Analysed	
Ascending arch	44	15 months (max. 4 yrs. 4 mths.)*	34	
Ascending and transverse arch.	46	9 months (max. 1 yr. 9 mths.)	16	
Transverse arch	39	7½ months (max. 3 yrs. 1 mth.)	24	
Transverse and descending arch.	No. of cases insufficient to generalise			
Descending arch	49	15 months (max. 3 yrs. 3 mths.)	11	
Descending aorta	39	10½ months (max. 6 years)	6	
Abdominal aorta	36	10 months (max. 3½ years)	42	

Power notes that the effect of wiring in relieving pain in cases of thoracic aneurysm is greater in thin walled aneurysms than in those which already contain much clot.

Pain in the early stage of aneurysm is due possibly to distention of the inflamed arterial wall; the severe pain of the later stages is felt when the aneurysm is brought into relation with resisting structures. He sees no advantage in combining electrolysis with wiring.

Two of Power's cases were operated upon twice.

Five of the sixteen cases recorded were treated by Dublin surgeons, and one of these (Sir W. I. de C. Wheeler's) was shown alive at the Royal Academy of Medicine in Ireland in March, 1921, eleven and a-half years after operation.

A. K. H.

* An exceptional case in which the disease lasted at least eight years has been omitted.

Fifteenth French Medical Congress, Strasburg, October, 1921. FORGUE (Montpellier): *Endresults in Mammary Carcinoma.* "Presse Médicale." October, 1921.

MODERN extensive dissections of the Handley and Halsted type have reduced the proportion of local recurrences by nearly 40 per cent., but have had no effect on the numbers of late internal metastases. The most frequent sites for recurrence are subclavicular lymphatics, intercostal spaces, intrathoracic, hepatic, and sternal infiltration. Of 285 personal cases of the author's, 115 are alive and well at the end of 3 years, and 42 survive, free from recurrence, at the end of 7 years (14 per cent.). Forgue believes in the widest possible removal of both skin and subcutaneous fascia, with both pectoral muscles; he follows Halsted in dissecting from thorax to axilla, but not in opening up the supraclavicular triangle (owing to aggravation of post operative shock). In view of the operative risks, to open the thorax for a removal of the internal mammary chain of lymphatics is scarcely justifiable. In cases of "pillow-arm," disarticulation at the shoulder joint is the only advisable procedure, if the patient's condition permit. Ovarian castration in young women with heart cancer has not given any results to justify the procedure. Improvement of endresults can only be brought about by early diagnosis and extensive early operation. It is a question of education of the public, by "discreet and persevering propaganda."

The author, like most French surgeons, preserves a rather doubtful attitude, towards the prophylactic effect of x-rays. WM. DOOLIN.

FISHER, C. F.: *Principles of the Pirquet Method of Feeding.* "Medical Record." December 10th, 1921.

IN this short paper the principles of the "Nem" or Pirquet method of feeding are outlined. The method was evolved in Vienna during the war, mainly in consequence of the shortage of food, but it gave such satisfactory results that its continuance is advocated. The "Nem" is the caloric value of one gram of milk of definite composition (Nahrung—Einheit—Milch = nutrition—unit—milk), and from this a table of the Nem value of the most important foods has been worked out. The fundamental principle is the calculation of an individual's food requirements from his "sitting height" ("Sitzöhe"). In 1881 Henning showed that the absorptive portion of the gastro-intestinal tract is always ten times the length of the sitting height. Pirquet demonstrated further, that the square of the sitting height equals the square area of the absorptive tract. He also proved that the cube root of ten times the body weight of normal individuals also equals the sitting height. The square of the sitting height represents the maximum number of "nems" required under any circumstances and three-tenths of this the minimum possible for existence at rest.

The optimum allows an extra two-tenths for exercise, one-tenth for growth, and one-tenth for reserve glycogen, giving a total of seven-tenths, which represents the number of "nems" required for normal existence.

The relation of body weight to sitting height is called the "pilandise." The figure 96 or over means good nutrition, under this signifies malnutrition. The calculations can be done quickly with a slide rule. Fisher considers the methods scientific and practical, and the simplest and most rational system of feeding so far devised. G. E. N.

LIAN, CAMILLE : *Asthma*. "La Presse Médicale." December 17th, 1921. FROM observations of the oculo-cardiac reflex (slowing of the pulse on compression of the eyeballs) which was positive in a large proportion of his cases of asthma, Lian concludes that bogus hypertonus is an important factor in the asthma syndrome. This theory naturally suggests the use of belladonna in treatment, and in his hands, with sufficiently large doses, this drug has given remarkably satisfactory results. He regards adrenalin (which acts by stimulation of the sympathetic) as the proper drug for the actual crisis, but he believes that belladonna is capable of preventing the crisis from occurring. G. E. N.

MARIE, P. L. : *The Schultz-Charlton Phenomenon in the Diagnosis of Scarlet Fever*. "La Presse Méd." December 17th, 1921.

MARIE discusses the difficulty sometimes encountered in the diagnosis of scarlet fever, where some of the signs are atypical, or where the rash has faded at the time of observation. He recounts various tests which have been proposed from time to time, but rejects all as unreliable. He thinks the Schultz-Charlton phenomenon may prove more helpful. Briefly the test consists in the fact that normal human serum (or serum from a convalescent case of scarlet fever after the third week) injected into the skin of a patient with scarlet fever will cause disappearance of the rash over an area the size of a five franc piece to that of the palm of the hand round the site of the puncture. The reaction appears in from 6 to 12 hours, and is not given by any animal serum. The test may also be used indirectly for diagnosis up to the twentieth day of the disease, by injecting serum from a doubtful case into one with a typical rash. If the former case is one of scarlet fever the test will be negative, but if the faded rash has been due to some other cause the characteristic phenomena of extinction will occur. He reviews various theories to explain the phenomenon, but concludes that the explanation is not yet clear, and that the test deserves further research. G. E. N.

CALVIN-SMITH, S. : *The Heart Irregularity called "Sino-auricular Block."* "Am. Journ. Med. Sci." October, 1921.

CALVIN-SMITH describes, and illustrates with numerous electrocardiographic records, a type of cardiac irregularity which he claims

is more common than the scanty literature of the subject would suggest. It was detected chiefly in healthy young men, and appeared while the pulse rate was slowing down after exertion. The condition was described by Lewis as "a peculiar disturbance in which the auricular beat is lost as well as the ventricular"—the pause being nearly as long as two normal cycles. It has to be differentiated from sinus arrhythmia (which is markedly affected by respiration), and from premature contractions (which disappear on exertion, and which generally cause subjective symptoms). The abnormality is frequently found in children, it may follow the administration of certain drugs (*e.g.* strychnine and atropin), and in some persons it may be brought out by exertion, mental excitement or emotional strain. It is probably due to a change in nerve control of the heart; and as it is not a pathological condition it does not require treatment.

G. E. N.

RAMSAY HUNT, J.: *The Striatal and Thalamic Types of Encephalitis*. "Am. Jour. Med. Sci." October, 1921.

HUNT concludes that the large basal ganglia, particularly the corpus striatum and the optic thalamus are frequently involved in epidemic encephalitis, and believes that this is the explanation of many of the puzzling features of the disease. As regards the corpus striatum he recognises three clinical types:—(1) the paleostriatal or paralysis agitans type. (2) The neostriatal or choreiform type, and (3) a combined or mixed type. Of the 25 cases which form the basis of his investigation, 18 were in the first group, four in the second, and three in the third. Involvement of the thalamus produces severe and persistent pain, with disturbances of superficial sensibility, more especially of the pain and temperature senses. He has not encountered any case of extensive anæsthesia, and tactile sensation has been very slightly affected.

G. E. N.

VEEDER, B. S., and HEMPELMANN, T. C.: *A Febrile Exanthem Occurring in Childhood (Exanthem Subitum)*. "Journal of the American Medical Association." December 3rd, 1921.

THESE authors describe a syndrome which is not dealt with in any of the text-books on pediatrics or infectious disease. They consider it a distinct entity, and propose the name "exanthem subitum."

The disease has a predilection for infants. The onset is abrupt without prodromal symptoms. The fever mounts rapidly to from 102 to 104 or more, remains high with perhaps slight morning remissions until the fourth day, when it falls to normal by crisis. Coincident with the temperature fall, there appears a rash, which is characteristic. It develops rapidly reaching its height in about twelve hours, and then fades in one or two days. The eruption is morbilliform and consists of small pale red macules or maculo-papules, from one-sixteenth to

three-sixteenth of an inch in diameter. There is frequently a pale areola about the macule. The lesions are profuse, and more marked on the trunk than on the face or extremities.

The blood count consists of a leukopenia, with a distinct lymphocytosis, the lymphocytes amounting to from 80 to 90 per cent.

Other symptoms are conspicuous by their complete absence. Thus there are no vomiting, cough, sore throat, lymphoid or splenic enlargement, etc. The disease would appear to be non-contagious.

LEONARD ABRAHAMSON.

HEWLETT, A. W., and SWEENEY, J. P. : *The Quinidine Treatment of Auricular Fibrillation*. "Journal of the American Medical Association." December 3rd, 1921.

THIS is one of a number of articles which have appeared recently in American journals on the treatment of auricular fibrillation by quinidine sulphate.

The authors report eleven cases in which the drug has been used. The treatment was controlled by frequent electro-cardiograms, a precaution which would seem to be advisable in the present state of our knowledge of quinidin. Six patients failed to recover the normal rhythm; in five cases the drug was successful; in two cases the success was transient, in three others the sinus rhythm was maintained up to the time of writing—a period of from two to four months. The cases where the irregularity was abolished were cases in which the fibrillation was of fairly recent occurrence. This tallies with the results obtained by other writers. Thus Frey pointed out that in a series of cases treated by him, the normal rhythm was restored in thirteen out of twenty-four patients who had been suffering from fibrillation less than a year, whereas it was restored in only five of nineteen patients in whom the fibrillation had lasted more than a year.

The amount of the drug necessary to restore the normal rhythm varied in the authors' cases from three grains to over one hundred grains. In common with other observers, they recommended a small preliminary dose for the first day, thus, three grains three or four times. After this they give six grains three times a day, and later six grains four or five times daily. The return to normal rhythm occurred most frequently on about the third day of full treatment. After the fifth day, few cases became regular, and it did not seem advisable to prolong the first course of treatment longer than one week. In the event of failure, a further course of treatment could be embarked on a later date.

As a rule the drug was well tolerated. One patient developed alarming symptoms; another patient died after doses amounting to 34 grains, but it was doubtful if the quinidin played more than a minor role in bringing about the fatal issue. Be that as it may, it is worthy of note that several fatalities are on record in the literature, and it would

appear to be essential to keep patients treated by quinidin under close supervision.

Perusal of this and many other monographs on the subject of quinidin makes one doubt whether it is advisable in the present state of knowledge to resort to the drug in cases of fibrillation. For of the cases in which normal rhythm is resumed—50 per cent. as a rule—many show a relapse after a comparatively short interval, a few develop alarming symptoms leading in some cases to a fatal issue and even in those in whom sinus rhythm is maintained, improvement in the symptoms is rarely striking. The drug is too potent to be lightly used by the uninitiated. Further research is essential.

LEONARD ABRAHAMSON.

MONTAGNANI, M.: *Haemoclastic Crisis and Paroxysmal Haemoglobinuria*.

"Presse Méd." December 24, 1921.

IN 1910 Micheli suggested that paroxysmal hæmoglobinuria should be looked upon as a manifestation of anaphylaxis. Widal, Abrami and Brissaud in a study of four cases were able to demonstrate shortly before the attacks all the features which characterise anaphylaxis. These features which they had previously grouped together under the new classical name "hæmoclastic crisis," are as follows: rapid fall of blood pressure, extreme leukopenia, delayed coagulability of the blood, diminished platelets, lowering of the refractometric index of the serum. They are due to a disturbance of the equilibrium of the colloids of the blood.

Montagnani reports a case of paroxysmal hæmoglobinuria in which he was able to reproduce an attack by immersion of the patient's hands in cold water. A study of the blood during the experiment showed all the features characterising the hæmoclastic crisis. The blood-pressure fell from 115 (systolic) to 91, the leukocytes from 9,800 to 2,500, the platelet diminished by almost two-thirds, the blood refused to clot. These changes reached their maximum about twenty minutes after the exposure to cold, and the attack of hæmoglobinuria took place shortly afterwards. He concludes that paroxysmal hæmoglobinuria is an example of autoanaphylactic shock produced by the action of cold and without the intervention of any foreign antigen.

Treatment was carried out on the lines recommended by Widal and his collaborators, and consisted in the injection into the patient's blood of his own serum (auto-serotherapy). The method proved ineffective. More success followed the use of anti-specific treatment, recommended originally by Murri. In this connection it is worthy of note that the Wassermann reaction was fully positive.

LEONARD ABRAHAMSON.

TRANSACTIONS.

ROYAL ACADEMY OF MEDICINE IN IRELAND

SECTION OF SURGERY.

A meeting of this section was held at the Royal College of Surgeons on November 18th, 1921, SIR W. I. DE C. WHEELER in the chair.

Exhibits.

MR. J. L. KEEGAN showed (1) a much hypertrophied appendix with a large concretion. (2) a mucocele of the gallbladder with an impacted stone.

Spinal Abscess with Paraplegia treated by Costo-transversectomy.

MR. R. A. STONEY showed a case of dorsal Pott's caries, with mediastinal abscess, treated by costo-transversectomy. The operation was performed on May 24th, 1921, and the paraplegia from which the patient had suffered was greatly improved.

MR. STONEY preferred a right approach to a left, as accidental injury to an intercostal artery close to the aorta was thus avoided. The operation presented no special difficulties.

SIR W. I. DE C. WHEELER preferred conservation treatment for cases with abscess. Radiography showed that an abscess often diminished or disappeared after an Albee graft.

MR. SETON PRINGLE believed that abscess cavities inclined to refill unless the vertebral column was adequately fixed.

MR. W. STEVENSON suggested the use of radium in these cases to stimulate the resistance of the surrounding tissues to tubercle. He had used radium successfully in tuberculous peritonitis.

Two Cases of Osteomyelitis of the Radius.

MR. J. C. MACAULEY showed two patients, illustrating the effects of acute pyogenic osteomyelitis of the radius which appeared, from the literature, to be a relatively rare disease. The first patient, a girl aged ten, was admitted to hospital with discharging sinuses in the forearm. A radiogram showed necrosis of the entire radial shaft with imperfect involucrum formation. The necrotic shaft was resected subperiosteally and good healing of the wound secured. A second radiogram, taken three months later, showed osteogenesis of the radius to be proceeding satisfactorily. Mr. MacAuley commented on the difficulty of preventing the development of deformity due to unequal growth of the ulna in such cases. The second patient was a girl aged 18, who had suffered from osteomyelitis of the radius in childhood. On admission to hospital

there was marked radial abduction with the wrist in fixed pronation leaving an unsightly deformity and much impairment of pronation. A radiogram showed defective growth of the radius with synostosis of the radio-carpal joint. At operation, the head and portion of the shaft of the ulna were excised, and a wedge removed from the radius, enabling the radial deformity to be over-corrected, and the hand to be placed in dorsiflexion. The patient was now shown to illustrate the result which he regarded as eminently satisfactory.

Radiograms of both patients, taken before and after treatment, were shown.

SIR W. I. DE C. WHEELER said that as regarded the treatment of such cases the results of bone-grafting in the forearm were disappointing. Only about 30 per cent. of good results could be expected.

MR. R. A. STONEY had seen no successful results of bone-grafting in the forearm. He suggested that in certain cases where there was considerable loss of the radial shaft, the ulna should be divided, and its proximal segment fixed to the distal portion of the radius.

MR. SETON PRINGLE thought that Mr. MacAuley's first case should be treated with successive plaster splints until the age of 16, and then bone-grafted.

Solid Oedema of the Face.

MR. H. STOKES showed a case of solid oedema of the lower part of the face, probably due to syphilis. There was a positive Wassermann, and the palate was deeply pitted, but was not perforated. The case had only just come to hospital, and no treatment had been yet given.

Acute Phlegmonous Gastritis.

MR. C. J. MACAULEY read a paper on acute phlegmonous gastritis, with report of a case in which he had recognised the condition at operation. He discussed the ætiology, pathology, diagnosis and possible treatment of the condition.

The paper was illustrated by coloured reproductions of the specimen obtained at autopsy.

(This paper will appear in a subsequent issue of the DUBLIN JOURNAL OF MEDICAL SCIENCE.)

SECTION OF MEDICINE.

A meeting of this Section was held on November 11th, 1921, the President, DR. A. PARSONS, in the chair.

Compression Myelitis.

SIR JOHN MOORE showed a case of compression myelitis due to Pott's caries treated by a spinal bone-graft. (See DUBLIN JOURNAL OF MEDICAL SCIENCE, January, 1922.)

Mikulicz Disease.

DR. T. G. MOORHEAD showed a case of this disease. (See DUBLIN JOURNAL OF MEDICAL SCIENCE, January, 1922.)

Pituitary Tumour.

DR. MOORHEAD showed a case of pituitary tumour in a woman, aged 47, who came to him in January last, complaining of dimness of vision. There was no headache, or other symptoms, and, apart from the fact that the blood pressure was over 200 m.m. Hg., the patient rather stout, and the menopause had occurred at the age of 37, there was nothing else besides the ocular phenomena to be made out. An ophthalmologist's report showed, however, that well marked bilateral hemianopsia existed, and an *x-ray* examination then made, revealed enormous enlargement of the pituitary fossa. The case appeared to fall in the group distinct from both acromegaly, and from Fröhlich's syndrome, as an example of pituitary tumour, with mainly local signs. Since January, the condition had been more or less quiescent, till a month ago, when the sight began to get worse. The patient refused operation, and so a course of *x-ray* treatment was now being tried.

Intra-Cranial Tumour with Evidence of Pituitary Insufficiency.

DR. G. E. NESBITT showed a girl of 17, who was admitted to the Richmond Hospital on October 20th, 1921, complaining of rapidly increasing loss of vision.

There was nothing abnormal in her history, except very defective education due to irregular attendance at school, and an attack of enteric five years ago. She menstruated first in June, 1920, had four periods in regular succession, and since then, *i.e.*, September, 1920, there had been complete amenorrhœa.

About six months ago she noticed that "a cloud occasionally floated before her eyes," disappearing in a few seconds, when she could again see quite clearly. About six weeks ago, one evening she suddenly got a sensation of "red flames before her eyes," and after this her vision became very indistinct. She could not give any more definite account of the nature of the loss of sight, but up to the time of her admission to hospital she could make her way about on the street, recognise friends, etc. About the same time as the eye symptoms appeared, she began to suffer from headaches, though these did not seem to have been severe. They occurred every two or three days, lasted an hour or so, and were referred to a point slightly on the left side of the forehead.

Up to about last June patient stated that she was always rather thin, but she then began to grow fat, so that her friends began to comment on how "fat and swollen" she was. There did not appear to be anything of importance in the family history—father, mother, two sisters and three brothers being alive and well.

Patient was obviously a big, strong, stout girl (5 ft. 5½ in. in height, and weighing 10 st. 4½ lbs.), and in most respects was as healthy as she looked, *i.e.*, the majority of her organs were sound, and her heart, lungs, kidneys, and digestive tract were normal or better. She had, however, certain outstanding features of importance. *She was almost blind*—could barely see fingers and only in small areas of the visual field. There were no other eye signs, though the light reflex was poor, and the various cranial nerves were normal. Dr. Cummins examined the eyes very carefully, and reported “well defined choked disc in each eye. Pathological appearances confined to discs, no hæmorrhage or exudation in neighbourhood. Both visual fields markedly restricted, especially above, but no bitemporal, right or left hemianopia.” Apart from the eye findings, no signs of organic nervous disease were discovered.

These signs, though few, were sufficiently definite to indicate increased intra-cranial pressure, and probably the presence of tumour. The next step was the more difficult one of localisation.

In an attempt to find the explanation, he (Dr. Nesbitt) was indebted to the House Surgeon, Dr. Teehan, who first pointed out the existence of certain features suggestive of the Fröhlich syndrome (*dystrophia adiposo-genitalis*). The adiposity was noteworthy and very marked about the abdomen, pelvis and thighs. She had had complete amenorrhœa for over a year, and the growth of pubic hair was scanty. Dr. Gibson examined her and reported *atrophy of the uterus*.

Her blood pressure was 90-110 m.m., temperature generally sub-normal (never above). The quantity of urine was slightly, but not markedly, increased. *Carbohydrate tolerance* was increased. 240 gm. glucose caused no glycosuria, though 500 gm. succeeded in doing so.

The thermic reaction (Cushing) on injection of 1 c.c. of extract of anterior lobe of pituitary was negative.

These signs seemed to implicate the pituitary, and the next step was obviously an *x-ray* examination.

Dr. Hardman reported :—“The sella turcica was not normal. It was ill-defined, and irregular in outline, and apparently much enlarged.” (Plates shown).

Discussion.

DR. ABRAHAMSON said he had seen two cases in Paris under treatment by *x-rays*.

DR. HARDMAN said he had no actual experience of treating such cases, but the localisation presented no difficulty. He thought prolonged exposure to very hard rays would be necessary.

MR. A. K. HENRY pointed out that anomalies in the loss of vision might be explained by differences in the relation of the optic nerves and chiasma to the tumour. Z. Cope had shown that the chiasma lay above and behind the fossa. Tumours came up in the angle between the nerves. Discussion of treatment was especially associated with

Cushing, who had done 155 cases by the transphenoidal route, and 40 otherwise. He thought it was time for surgical intervention in these cases. Improvement of vision was often satisfactory. The transphenoidal method of approach with submucous resection of the septum was, in his opinion, the safest. Cushing's mortality rate was 9.7 per cent.

MR. McCONNELL said that medical measures failed to relieve these cases, that *x*-rays were successful in some, and should be tried, but not persisted in to the point where vision was lost. No surgical method at present would completely remove the tumour, and he, therefore, preferred the safest, which, in his opinion also, was the transphenoidal.

THE PRESIDENT (DR. A. PARSONS) mentioned a case in which the loss of the visual field had been horizontal.

Gumma of the Liver.

DR. V. M. SYNGE read a note of a case of gumma of the liver. (See DUBLIN JOURNAL OF MEDICAL SCIENCE, December, 1921.)

SECTION OF MEDICINE.

A meeting of this section was held on December 9th, 1921, the President, DR. A. PARSONS, in the chair.

Electro-cardiography.

DR. LEONARD ABRAHAMSON read a paper entitled "An Introduction to Electro-cardiography."

The author, having described the mechanism of the electro-cardiograph, and the method of taking electro-cardiograms, pointed out that the form of the tracings was dependent on the site of origin and on the route of propagation of the excitation wave. An abnormal tracing indicated either that the heart-beat had originated in an abnormal focus or having originated in the normal focus was propagated in an abnormal direction.

Dr. Abrahamson then demonstrated by the medium of lantern-slides a series of tracings taken by himself and representing the various abnormalities. In conclusion he summarised as follows the services that can be rendered by the electro-cardiograph in every way :

First, the instrument will definitely clear up any cardiac irregularity, however complex.

Second, a doubtful case of valvular disease may be elucidated by the finding in an electro-cardiogram of ventricular preponderance. Furthermore, in congenital heart disease we get a typical tracing also at times in mitral stenosis. Nevertheless, it may be said that in valve lesions *per se* the instrument is of little assistance.

Third, we may be able sometimes to discover myocardial disease apart from irregularities. Thus we may diagnose by the electro-cardiograph an otherwise unrecognisable lesion of a branch of the

bundle of His, or of the arborisation of this bundle. More work is necessary on this aspect of the subject.

SIR JOHN LUMSDEN gave an account of the introduction of this apparatus to Dublin. It had been provided by the joint organisation of the Red Cross and the Order of St. John at his suggestion, it was installed in Mercer's Hospital as being a suitable central situation, and the understanding was that it should be available free for the examination of cases from any of the hospitals. Arrangements had also been made for the examination of private cases. Discussing the technical aspect of the subject he said that the wonderful advance in recent years in the subject of cardiography increased our admiration and respect for the great physicians of the past century, who, without these aids, had discovered so much, and he did not think the succeeding generation would have made much progress without them. Their experience with the apparatus so far showed that there were types of cases where an accurate diagnosis could not have been made without it, but on the other hand there were obvious limitations, and it by no means replaced the older methods of physical examination. He laid stress on the importance of skilled reading of the tracings.

DR. H. F. MOORE expressed his appreciation of the tracings shown. He had found the instrument of great service both in diagnosis and in treatment, but while he reserved it for suitable cases, it was used as a routine method of examination in many hospitals. He referred to cases where diagnosis was impossible by other means, such as those of "arborisation block." He had found quinidine sulphate unsatisfactory in auricular fibrillation as regards improvement in rhythm, though he had not seen any case of embolus following its use, such as had been frequently reported. He also spoke favourably of the practice of wiring the electro-cardiograph room to the wards, particularly for the cases of helpless or very nervous patients.

DR. CROFTON inquired whether septic and toxic states, such as tuberculosis, gave any characteristic type of tracing.

DR. W. D. O'KELLY suggested that the foetal heart might produce a tracing sufficient for its recognition.

DR. R. J. ROWLETTE said that he had found the instrument of great interest, and of extreme importance in several of his cases, particularly that of auricular flutter referred to in the paper. The changes of rhythm during treatment were very clearly brought out, while the puzzling nature of the case on admission had been at once elucidated.

DR. G. E. NESBITT said that it was of great practical importance to gain a clear idea of the absolute value of the apparatus in routine work. There were obvious objections to sending patients to another institution for examination, and if the instrument were indispensable, he thought most up-to-date hospitals would be compelled to instal it, in spite of the very great expense. No one would deny the enormous service the introduction of the method had given to the study of obscure

types of heart disease, but he thought the majority of these were now capable of recognition by other means.

DR. ABRAHAMSON in reply, deprecated the routine use of the method by non-experts. He thought the dangers of quinidine had been exaggerated. In two of his cases, the rhythm had changed to flutter—in two it did not change. He thought the drug was often given up too soon. Post febrile conditions frequently showed evidence of cardiac damage, generally in the form of an increased S-R interval. He thought that the foetal heart did not affect the tracings. He considered the value of the instrument very great in a proportion of the cases met with, but it would be a great mistake to instal an instrument at such expense in an institution where the total number of cardiac cases dealt with might be comparatively small.

Discussion on Mr. W. C. Stevenson's Paper on Peritonitis treated by Radium.

DR. W. M. CROFTON said that everyone thought himself able to cure tuberculous peritonitis. He was not satisfied that this method alone was correct—he considered that immunisation was essential with this as with other modes of treatment. The malignant case described, which he had seen, was a most remarkable one—clinically it resembled tuberculous peritonitis but gave no reaction with tuberculin. The patient was in a very bad state, and the improvement, particularly the rapid relief from pain, was extraordinary. He had often noticed similar if less striking relief from pain after the use of iodine-menthol-radium.

DR. R. R. LEEPER said that these subjects were outside his usual scope, but he felt it his duty to come to the meeting specially to testify to what he considered a miraculous result in the third case, which he knew personally. The girl had been in such bad health that he thought her hopeless, and he had been equally surprised and delighted to watch her rapid restoration to health.

DR. B. SOLOMONS had operated upon this case a year before and found masses of colloid cancer in the abdomen for which he thought nothing could be done. He was very surprised to hear the result. He would like records of unsuccessful cases, which were seldom heard about. He enquired under what circumstances *x*-rays would be preferred to radium.

THE PRESIDENT said he had seen some extraordinarily brilliant results in thoracic sarcoma with massive doses of radium, but within a few months they relapsed and died in spite of further treatment.

DR. STEVENSON in reply, regarded radium as an adjuvant to other forms of treatment, and did not claim that it superseded them. Treatment should be kept up till no further signs could be detected or even longer. He had noticed that sometimes one form of treatment which acted well for a time seemed to lose its effect and progress ceased. It was then advisable to try another. This applied particularly to radium and *x*-rays.



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